



# TIER 1 INVESTIGATION REPORT FORM

Due within one year of the occurrence of any of the following:

- Receiving analytical results, which exceed action levels, while conducting investigations pursuant to paragraph (F)(3)(b) of OAC 1301:7-9-13;
- Electing to conduct corrective actions pursuant to paragraph (B)(2) of OAC 1301:7-9-13;
- Receiving analytical results, which exceed action levels, from a closure assessment conducted pursuant to paragraph (F) of OAC 1301:7-9-12; or
- Conducting corrective action activities pursuant to paragraph (B)(3) and (B)(4) of OAC 1301:7-9-13.

## OWNER/OPERATOR AND FACILITY DATA

### FACILITY INFORMATION:

COMPANY: Former Sinclair Gas Station  
 ADDRESS: 800 Wyoming Avenue  
 CITY: Lockland  
 COUNTY: Hamilton  
 ZIP CODE: 45215  
 LAT/LONG: 39.2272, -84.4641  
 FACILITY ID #: 31010237

### UST OWNER INFORMATION:

COMPANY: Lawrence L Rhodes  
 ADDRESS: 3815 Erie Ave  
 CITY, STATE: Cincinnati, OH  
 ZIP CODE: 45208  
 CONTACT PERSON: Deceased  
 PHONE: NA

### UST OPERATOR INFORMATION:

COMPANY: Lawrence L Rhodes  
 ADDRESS: 3815 Erie Ave  
 CITY, STATE: Cincinnati, OH  
 ZIP CODE: 45208  
 CONTACT PERSON: Deceased  
 PHONE: NA

### PROPERTY OWNER INFORMATION:

COMPANY: Village of Lockland  
 ADDRESS: 101 N. Cooper Avenue  
 CITY, STATE: Lockland, OH  
 ZIP: 45215  
 CONTACT PERSON: David Krings  
 PHONE: 513-761-1124

## UNDERGROUND STORAGE TANK (UST) SYSTEM DATA

Tank #	Date Installed	Capacity	Const. Material	Tank Status	Date Removed
1	UNK	2000	Bare Steel	R	09/17/12
2	UNK	2000	Bare Steel	R	09/17/12
3	UNK	8000	Bare Steel	R	09/18/12

**STATUS=** *OOS<90* – Out of Service < 90 days *OOS>90* – Out of Service > 90 days **RE** - Replace **R** - Removed  
*CIU* - Currently In Use **NA** - Not Applicable **CIS** - Change in Service **CIP** - Closed in Place

## SITE HISTORY AND VISUAL SITE EVALUATION

The USTs sat unused starting in 1976 or 1978. The owner was issued violations in 2008 for improper management of out-of-service USTs. The owner of the USTs is deceased.

The property is currently owned by the Village of Lockland which took title in December 2011. The Village, acting as a volunteer with community grant funds, demolished the service station structure and had three gasoline USTs (two, 2,000-gallon and one, 8,000-gallon) removed in September 2012. The southern portion of the property is covered by concrete and gravel, while the northern portion of the site is covered in grass and trees.

Petro Environmental conducted the closure of the tanks and product lines on September 17 and 18, 2012. Certified Inspector Wayne Roether was present during the removal. The closure report form was completed by Mr. Chris Tucker.

Soil and Materials Engineers (SME) conducted soil boring and monitoring well installation activities for the Tier 1 Source Investigation on January 21, 22, and 23, 2013. The monitoring wells were sampled on January 28, 2013. Slug testing was performed on February 18, 2013. The Tier I Investigation Report form was completed by Mr. Steven Reutter.

## TIER 1 SOURCE INVESTIGATION

POTENTIAL SOURCE(S):  
Releases from USTs, piping run, or dispensers.

POTENTIAL SOURCE AREA(S):  
Area surrounding the former USTs and service station.

CHEMICALS OF CONCERN:  
Benzene, Toluene, Ethylbenzene, Xylenes, Methyl tert-butyl ether, Gasoline Range Organics

### **SUBSURFACE INVESTIGATION:**

SOIL BORINGS INSTALLED DURING THIS INVESTIGATION / DATE:  
MW1 (1/21/13), MW2 (1/22/13), MW3(1/22/13), and SB1 (1/22/13). The soil boring was advanced to collect geotechnical samples only.

PREVIOUSLY INSTALLED SOIL BORINGS / DATE:  
None

MONITORING WELLS INSTALLED DURING THIS INVESTIGATION / DATE:  
MW1 (1/22/13), MW2 (1/22/13), MW3 (1/22/13)

PREVIOUSLY INSTALLED MONITORING WELLS / DATE: \_\_\_\_\_  
 None

SB/MW	Install Date	Location	Installed With*	Total Depth (ft)	Depth to GW (ft)	Static GW (ft)	Depth to Bedrock (ft)	Screened Interval (ft)	MW Diameter
MW1	1/21/13	In UST excavation	HSA/SS	30	8.5	7.85	NA	7-17	2"
MW2	1/22/13	In UST excavation	HSA/SS	16	8	6.72	NA	6-16	2"
MW3	1/22/13	In UST excavation	HSA/SS		8	6.19	NA	6-16	2"
SB1	1/22/13	In grassy area north of USTs	HSA/SS	6	NA	NA	NA	NA	NA

\*HSA/SS – hollow stem auger/split spoon, DP – direct push, HA – hand auger

### FIELD SCREENING

INSTRUMENT USED: Mini Rae 2000 Photo Ionization Detector

METHODOLOGY USED:

A representative portion of each sample was placed in a resealable bag. Bags were placed in a heated truck cab to allow volatilization of vapor phase hydrocarbons. The PID probe was inserted into the headspace of the bag and the reading was recorded.

CALIBRATION PROCEDURES:

Meter calibrated on January 21, 22, and 23, 2013 with 100 ppm isobutylene gas.

SB/MW#	SB1	MW1	MW2	MW3				
Depth	PID/FID Result	PID/FID Result	PID/FID Result	PID/FID Result	PID/FID Result	PID/FID Result	PID/FID Result	PID/FID Result
0-2'	<1	<1	1.3	2.1				
2-4'	<1	<1	41.7	<1				
4-6'	<1	<b>1.3</b>	<b>113</b>	<b>11</b>				
6-8'		<1	<b>16.3</b>	<1				
8-10'		<1 ▼	10.5 ▼	1494 ▼				
10-12'		<1	1.8	28.6				
12-14'		<1	3.9	4.1				
14-16'		<1	2.8	7.1				
16-18'		<1						
18-20'		<1						
20-22'		<1						
22-24'		<1						
24-26'		<1						
26-28'		<1						
28-30'		<1						
30-32'								
32-34'								
34-36'								
36-38'								
38-40'								
40-42'								
42-44'								
44-46'								
46-48'								
48-50'								
GW Depth	NA	8.5	8	8				

The soil samples that were submitted for analysis are marked in **BOLD**. Depth where groundwater was encountered is marked with a ▼.

### SOIL CLASSIFICATION

**SOIL CLASSIFICATION:**

**SOIL SYMBOL:**

SOIL CLASS 1

GW, GP, GM, GC, SW, SP, SM,

SOIL CLASS 2

SC, ML, CL, OL, MH

SOIL CLASS 3

CH, OH, PT

MARK THE CORRECT CHOICE:

SOIL CLASS 1 ☐

SOIL CLASS 2 ☒

SOIL CLASS 3 ☐

### LABORATORY DATA

LABORATORY NAME: ALS Laboratory Services

ADDRESS: 4388 Glendale Milford Rd, Cincinnati, Ohio 45242

PHONE #: (513) 733-5336

CHEMICAL OF CONCERN / TEST METHOD: BTEX, MTBE (SW8021); TPH-GRO (SW8015)

DATE SAMPLES RECEIVED BY LAB: 1-23-13 (Soil); 1-28-13 (Water)

DATE SAMPLES ANALYZED BY LAB: 1-25-13 (8015), 2-3-13 (8021 soil), 2-4-13 (8021 water)

TEMPERATURE OF COOLER/SAMPLES: 2 C° soil samples, 4.6 C° water samples

### IMMEDIATE CORRECTIVE ACTIONS

FREE PRODUCT PRESENT: YES ☐ NO ☒

AMOUNT OF FREE PRODUCT RECOVERED TO DATE: \_\_\_\_\_  
None

LOCATION OF FREE PRODUCT: \_\_\_\_\_  
None

### OFF-SITE ACCESS

IS OFF-SITE ACCESS REQUIRED TO DELINEATE COCs: YES ☐ NO ☒

IF YES, DESCRIBE: \_\_\_\_\_  
COCs have been delineated on-site.

### GROUNDWATER DETERMINATION

*MARK THE CORRECT CHOICE*

THE SATURATED ZONE IS ASSUMED TO BE GROUND WATER: YES ☒ NO ☐

THE SATURATED ZONE IS NOT CONSIDERED GROUND WATER: YES ☐ NO ☒ N/A ☐

DEPTH TO THE SATURATED ZONE: <15' ☒ 15'-30' ☐ 31-50' ☐ > 50' ☐

***IF THE SATURATED ZONE IS NOT CONSIDERED GROUND WATER, DOCUMENTATION MUST BE PROVIDED:***

Saturated zone is considered groundwater. Hydraulic conductivity in the saturated zone is approximately 1.258E-5.  
Slug testing results are attached in Appendix G.

GROUND WATER FLOW DIRECTION: Northeast

### DRINKING WATER DETERMINATION

**IF ANY OF THE FOLLOWING FOUR ITEMS APPLY, GROUND WATER IS CONSIDERED DRINKING WATER:**

- 1.) The UST site or surrounding area is located in a Drinking Water Source Protection Area as defined by paragraph (C)(5) of OAC 1301:7-9-13: YES ☒ NO ☐

DESCRIBE: Site is located within a 1 year travel time of Wyoming DWSPA. A map showing the location of the Wyoming DWSPA and the site are attached in Appendix G.

- 2.) The UST site is in a Sensitive Area as defined by OAC 1301:7-9-09: YES ☒ NO ☐

DESCRIBE: \_\_\_\_\_

Site is located at S3 T3E R1N, and is considered a Sensitive Area as defined by OAC 1301:7-9-09.

- 3.) A drinking water source in the ground water is identified within the surrounding area, even if the source is completed into a lower saturated zone than the saturated zone to be evaluated on an UST site. This identification shall include the information required in paragraph (I)(1)(b) of OAC 1301:7-9-13: YES ☒ NO ☐

DESCRIBE: \_\_\_\_\_

Seven (7) public water supply wells were identified in the surrounding area at depths of 192 to 200 feet below ground surface. Three (3) presumed monitoring wells at depths of 11 to 30 feet below ground surface were also identified in the surrounding area.

- 4.) A surface water body is located within three hundred feet of the UST site: YES ☐ NO ☒

DESCRIBE: \_\_\_\_\_

The nearest surface water body is the North Fork of the Mill Creek, approximately 1,300 feet east of the site

**IF THE UST SITE DOES NOT MEET THE DRINKING WATER REQUIREMENTS OF THE FOUR ITEMS LISTED ABOVE, THEN GROUND WATER UNDERLYING THE UST SITE SHALL BE CONSIDERED NON-DRINKING WATER IF ANY ONE OF THE BELOW SIX ITEMS APPLY:**

- 1.) Ground water in the upper saturated zone yields less than three gallons per minute; YES ☐ NO ☐ Not Evaluated ☒

DESCRIBE: \_\_\_\_\_

Groundwater meets drinking water requirements above.

- 2.) Ground water in the upper saturated zone has a background level of total dissolved solids of three thousand milligrams per liter or greater; YES ☐ NO ☐ Not Evaluated ☒

DESCRIBE: \_\_\_\_\_

Groundwater meets drinking water requirements above.

- 3.) An UST site is located in an area where an urban setting designation pursuant to Chapter 3746 of the Revised Code and rules adopted there under has been approved by the director of Ohio Environmental Protection Agency and the owner and operator verifies that the urban setting designation remains protective of the potable use pathway in accordance with OAC 3745-300-10(D)(3)(b); YES ☐ NO ☐ Not Evaluated ☒

DESCRIBE: \_\_\_\_\_

Groundwater meets drinking water requirements above.

- 4.) No potable wells are located within 300 feet of an UST site based on a physical survey and an ordinance requires a mandatory tie-in to a municipal water system for all properties in the surrounding area; YES ☐ NO ☐ Not Evaluated ☒

DESCRIBE: \_\_\_\_\_

Groundwater meets drinking water requirements above.

- 5.) No potable wells are located within 300 feet of an UST site based on a physical survey and an ordinance prohibits the installation of potable water wells at all properties within the surrounding area; or YES ☐ NO ☐ Not Evaluated ☒

DESCRIBE: \_\_\_\_\_

Groundwater meets drinking water requirements above.

- 6.) No potable wells are located within 300 feet of an UST site based on a physical survey and 100 percent of the properties within 300 feet of an UST site area are connected to a municipal water source or a municipal source is readily available. YES ☐ NO ☐ Not Evaluated ☒

DESCRIBE: \_\_\_\_\_

Groundwater meets drinking water requirements above.

#### DRINKING WATER DETERMINATION CONCLUSIONS

Groundwater is considered drinking water: ☒

Groundwater is not considered drinking water: ☐

#### SITE MAXIMUM CONCENTRATIONS

	SOIL				GROUND WATER		
	SB	Depth	Conc. mg/kg	Action Level	MW	Conc. mg/L	Action Level
BENZENE	MW1	6-8'	0.91	0.15	MW1	0.38	0.005
TOLUENE	MW2	6-8'	0.0098	49.1	MW1	0.15	1
ETHYLBENZENE	ND	ND	ND	45.5	MW1	0.1	0.7
TOTAL XYLENES	MW1	6-8'	0.0076	469	MW1	0.68	10
MTBE	MW2	4-6'	0.029	0.47	ND	ND	0.04
BENZO (a) ANTHRACENE							NA
BENZO (a) PYRENE							NA
BENZO (b) FLUORANTHENE							NA
BENZO (k) FLUORANTHENE							NA
CHRYSENE							NA
DIBENZ (a,h) ANTHRACENE							NA
INDENO (1,2,3-cd) PYRENE							NA
NAPHTHALENE							NA
TPH (C6-C12)	MW2	4-6'	25	5,000	N/A	N/A	N/A
TPH (C10-C20)					N/A	N/A	N/A
TPH (C20-C34)					N/A	N/A	N/A
OTHER:							

## TIER 1 DECISIONS

*Select one of the following:*

- ☐ The concentrations of all chemical(s) of concern are at or below action levels determined in accordance with paragraph (I)(2)(f) of OAC 1301:7-9-13 for all applicable pathways, and no further action is requested.

or

- ☒ The concentrations of chemical(s) of concern are above applicable action level(s) determined in accordance with paragraph (I)(2)(f) of OAC 1301:7-9-13, and the following chemicals of concern and pathways require further evaluation:

If applicable, please list the COCs and the pathways that failed:

Chemicals of Concern	Soil Pathways	Chemicals of Concern	GW Pathways
Benzene	Soil to drinking water leaching	Benzene	Drinking water ingestion

Upon approval of the completeness of the Tier 1 Investigation Report, the owners and operators are planning on conducting one or a combination of the following:

- A.) An Interim Response Action:    Yes    ☐
- B.) A Tier 2 Evaluation:                Yes    ☒
- C.) A Remedial Action Plan:          Yes    ☐

## MISCELLANEOUS DATA

### **THE FOLLOWING ITEMS MUST BE ATTACHED:**

***ADDITIONAL INFORMATION WHICH IS REQUIRED BY OAC 1301:7-9-13 OR ADDITIONAL INFORMATION WHICH CLARIFIES THE INVESTIGATION ACTIVITIES SHALL BE SUBMITTED AS APPENDICIES TO THIS REPORT.***

### **TABLES:**

TABLE 1 - SOIL CONCENTRATIONS COMPARED TO ACTION & DELINEATION LEVELS

TABLE 2 - GROUND WATER CONCENTRATIONS COMPARED TO ACTION & DELINEATION LEVELS

TABLE 3 - MONITORING WELL GAUGING DATA

### **FIGURES:**

FIGURE 1 - TOPOGRAPHIC MAP

FIGURE 2 - SITE MAP

FIGURE 3 - SITE MAP WITH SOIL BORING LOCATIONS, SOIL CONCENTRATIONS AND SAMPLE DEPTH

FIGURE 4 - SITE MAP WITH MONITORING WELLS AND GROUND WATER CONCENTRATIONS

FIGURE 5 - GROUND WATER CONTOUR MAP

### **APPENDIX:**

APPENDIX A – SOIL BORING LOGS

APPENDIX B – MONITORING WELL CONSTRUCTION DIAGRAMS

APPENDIX C – MONITORING WELL DEVELOPMENT & SAMPLING FORMS

APPENDIX D - SOIL CLASSIFICATION FORM

APPENDIX E – LABORATORY ANALYTICAL REPORT

APPENDIX F – CHAIN OF CUSTODY

APPENDIX G – DRINKING WATER EVALUATION SUPPORTING DOCUMENTATION

The Tier 1 Investigation Report Form **must** be signed by the UST owner/operator. The owner/operator is responsible for ensuring all data is accurate, and the form is legible and complete. The owner/operator and potentially liable party is unknown.

**OWNER/OPERATORE SIGNATURE:** UNKNOWN

**PRINT NAME:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

### **FORM PREPARED BY:**

NAME: Steven A Reutter  
COMPANY: Soil and Material Engineers  
ADDRESS: One North Commerce Park Drive, Suite 318  
PHONE #: 513-348-0766  
EMAIL: reutter@sme-usa.com

## CHEMICALS OF CONCERN AND RECOMMENDED LABORATORY METHODS

Analytical Group 1 - light distillate products - including unleaded gasoline, leaded gasoline and aviation gasoline;

Analytical Group 2 - middle distillate products - including diesel, light fuel oils, stoddard solvents, mineral spirits, kerosene, and jet fuels;

Analytical Group 3 - heavy petroleum distillate products - including, but not limited to, lubricating and hydraulic oils;

Analytical Group 4 - used oil

Analytical Group 5 - unknown petroleum products or petroleum products other than those listed in analytical groups 1, 2, 3 and 4. Additional chemical(s) of concern and analytical methods must be selected, as appropriate, based on reasonably available information related to the product stored, including additives, impurities and degradation products. In addition, chemical(s) of concern should be selected based on their toxicity, mobility, and persistence in the environment. The owners and operators shall consult with the fire marshal for the appropriate chemical(s) of concern for products not in analytical group 1, 2, 3 and 4.

	Analytical Group Number	1	2	3	4	5	Analytical Methods
		Light Distillates	Middle Distillates	Heavy Distillates	Used Oil	Unknowns & Others	
	Chemical						
Aromatics	Benzene	x	x		x		8021/8260
	Toluene	x	x		x		
	Ethylbenzene	x	x		x		
	o, m and p-Xylenes	x	x		x		
Additives	Methyl tertiary-butyl ether (MTBE)	x			x		
Polynuclear Aromatics	Benzo(a)anthracene		x	x	x		8270/8310
	Benzo(a)pyrene		x	x	x		
	Benzo(b)fluoranthene		x	x	x		
	Benzo(k)fluoranthene		x	x	x		
	Chrysene		x	x	x		
	Dibenz(a,h)anthracene		x	x	x		
	Indeno(1,2,3-c,d)pyrene		x	x	x		
	Naphthalene		x	x	x		
Chlorinated Hydrocarbons	Volatile Organic Hydrocarbons				x		8260
Total Petroleum Hydrocarbons *1	TPH (C6 – C12)	x			x		8015
	TPH (C10 – C20)		x		x		
	TPH (C20 – C34)			x	x		
	Varies based on UST contents			x	x	*2	

\*1 TPH analysis is not required for ground water samples.

\*2 Additional chemical(s) of concern and analytical methods must be selected, as appropriate, based on reasonably available information related to the product stored, including additives, impurities and degradation products. In addition, chemical(s) of concern should be selected based on their toxicity, mobility, and persistence in the environment. The owners and operators shall consult with the fire marshal for the appropriate chemical(s) of concern for products not in analytical group 1, 2, 3 and 4.

## **TABLES**

***Table 1 – Soil Concentrations Compared to Action and  
Delineation Levels***

***Table 2 – Groundwater Concentrations Compared to Action  
and Delineation Levels***

***Table 3 – Monitoring Well Gauging Data***

Table 1  
SOIL CONCENTRATIONS COMPARED TO ACTION AND DELINEATION LEVELS  
FORMER SINCLAIR STATION  
800 W. WYOMING AVENUE  
LOCKLAND. OHIO

Chemicals of Concern	STANDARDS												SME TIER I INVESTIGATION						
	Action Levels										Delineation Level		Sample Location	MW1	MW1	MW2	MW2	MW3	MW3
	Direct Contact			Soil to Indoor Air		Soil to Outdoor Air			Soil to Drinking Water Leaching	Soil to Non-Drinking Water Leaching									
	R	NR	EW	R	NR	R	NR	EW											
												Sample Depth	4.0'-6.0'	6.0'-8.0'	4.0'-6.0'	6.0'-8.0'	4.0'-6.0'	7.0'-8.0'	
VOC (mg/kg)																			
Benzene	9.8	100	310	1.04	6.50	32.70	20.60	221	0.15	12.80	1.04		<0.0056	0.91	<0.0056	<0.0059	<0.0059	<0.0061	
Toluene	590	5900	24000	61.3	994	1930	3150	4090	49.10	760	61.30		<0.0056	<0.0055	0.039	0.0098	<0.0059	<0.0061	
Ethylbenzene	1500	17000	160000	199	3230	6280	10300	13300	45.50	2480	199.00		<0.011	<0.011	<0.011	<0.012	<0.012	<0.012	
Total Xylenes	660	6400	7000	15.7	254	494	806	1040	469	194	15.70		0.0061	0.0076	<0.0056	<0.0059	<0.0059	<0.0061	
MTBE	5300	57000	57000	1240	20200	39300	64200	83100	0.47	14600	1240.00		<0.0056	<0.0055	0.029	0.012	<0.0059	<0.0061	
TPH (mg/kg)	Soil Saturation Standards (CL)																		
TPH C6-C12	5.0E+03																		

Notes: Results in units shown.  
MTBE- Methyl tertiary-butyl ether  
Detected results shown in **BOLD**.  
< - Not detected at listed detection limit.  
ft bgs - feet below ground surface.  
Shaded results exceed standard  
R - Residential  
NR - Non-residential  
EW - Excavation Worker

TABLE 2  
GROUND WATER CONCENTRATIONS COMPARED TO ACTION AND DELINEATION LEVELS  
FORMER SINCLAIR STATION  
800 W. WYOMING AVENUE  
LOCKLAND. OHIO

Chemicals of Concern	Groundwater Standards									Delineation Level	SME TIER I INVESTIGATION			
	GI	Groundwater to Outdoor Air			Groundwater to Indoor Air		Groundwater Direct Contact				Sample Location	MW-1	MW-2	MW-3
		R	NR	EW	R	NR	R	NR	EW		Depth Collected	6 - 16 feet		
VOC (mg/L)														
Benzene	0.005	860	541	5800	4.29	26.8	9.8	100	310	0.428		0.38	<0.0020	0.25
Toluene	1	34000	55600	72000	155	2520	590	5900	24000	15.5		0.15	<0.0050	<0.0050
Ethylbenzene	0.7	86300	141000	183000	382	6190	1500	17000	160000	38.1		0.1	<0.0050	<0.0050
Total Xylenes	10	8960	14600	18900	41.4	672	660	6400	7000	10		0.68	<0.010	<0.010
MTBE	0.04	885000	1000000	1000000	12400	201000	5300	57000	57000	1240		<0.0020	<0.0020	<0.0020

Notes: Results in units shown.  
Detected results are in **BOLD**.  
< - Not detected at listed detection limit.  
Shaded results exceed standard.  
MTBE- Methyl tertiary-butyl ether

GI - Groundwater Ingestion  
R - Residential  
NR - Non-residential  
EW - Excavation Worker

**TABLE 3**  
**MONITORING WELL GAUGING DATA**  
**FORMER SINCLAIR STATION**  
**800 W. WYOMING AVENUE**  
**LOCKLAND, OHIO**

Monitoring Well ID	TOC Elevation	DTW- From TOC	Groundwater Elevation	Date
MW1	100.32	7.85	92.47	1/28/2013
MW2	100.00	6.72	93.28	1/28/2013
MW3	99.91	6.91	93.00	1/28/2013

Note: Gauging baseline of 100' is the grounding wire cap on southeast side of the second telephone pole located north of the intersection of West Wyoming Avenue and Elm Street.

## **FIGURES**

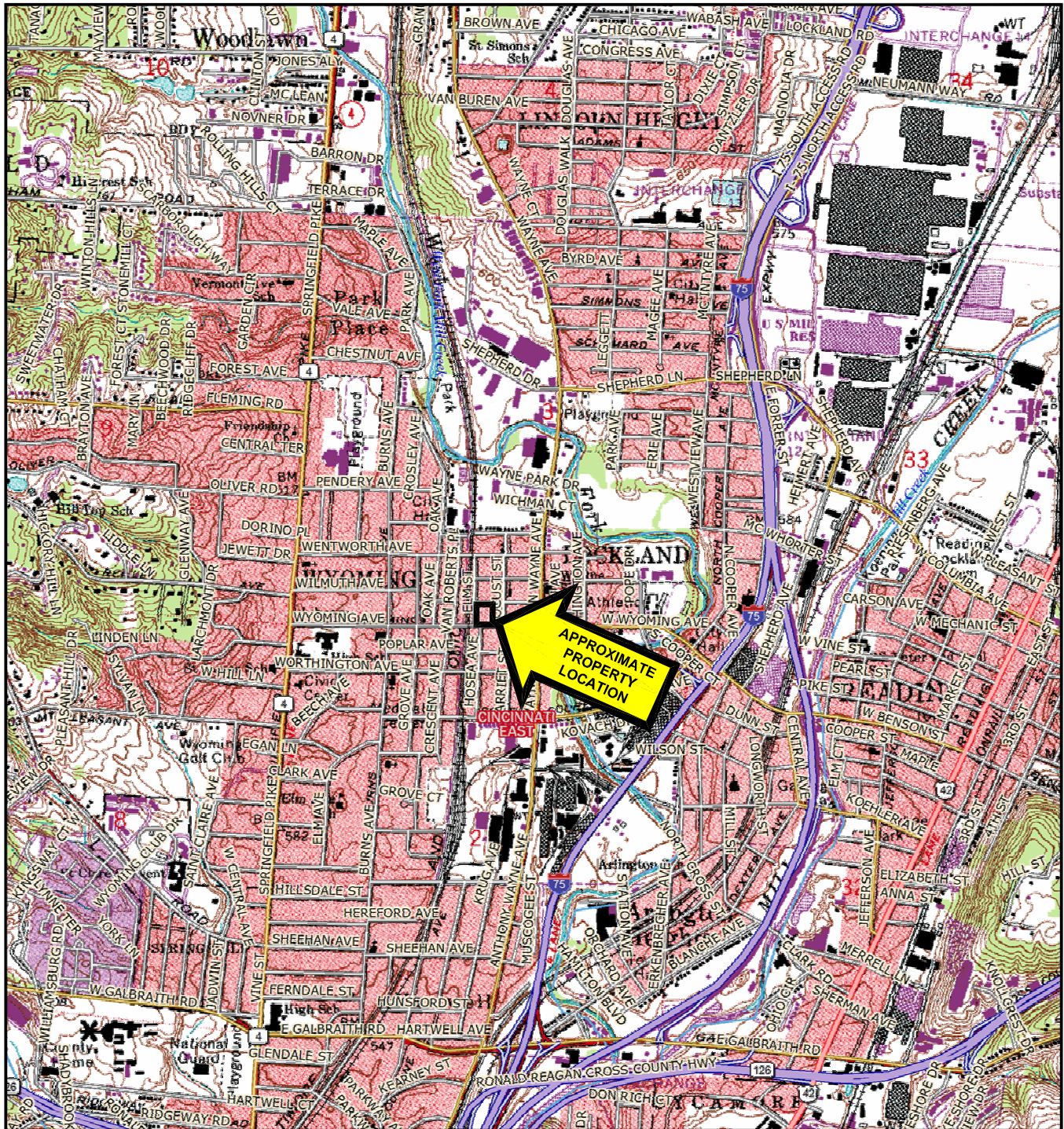
***Figure 1 – Property Location Map***

***Figure 2 – Sample Location Diagram***

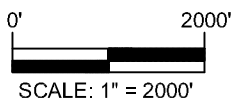
***Figure 3 – Soil Boring Locations, Soil Concentrations,  
and Sample Depths***

***Figure 4 – Monitoring Wells and  
Groundwater Concentrations***

***Figure 5 – Groundwater Contour Map***



Base map obtained from ©DeLorme Topo North America™ 9.



USGS QUADRANGLE(S) REFERENCED  
CINCINNATI EAST- 1988



Dec 10, 2012 - 5:35pm - jblake

R:\63000\063207.09\DWGS\rev0\63207.09-01.dwg

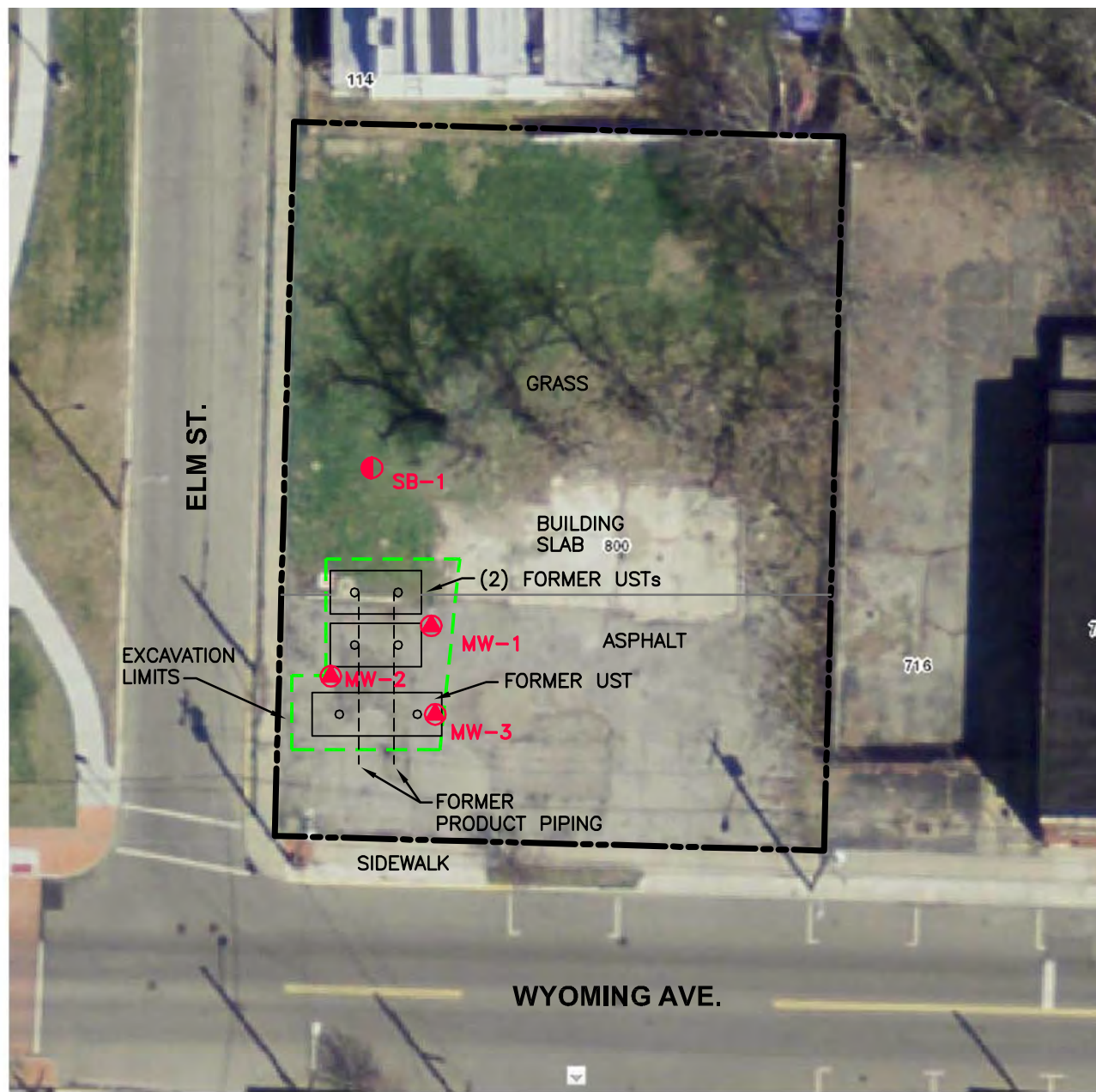


**Indiana  
Michigan  
Ohio**

Date	12-10-12
Drawn By	JAB
Scale	1" = 2000'
Project	063207.09

**PROPERTY LOCATION MAP  
FORMER SINCLAIR STATION  
800 W. WYOMING AVE.  
LOCKLAND, OHIO**

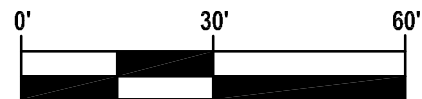
**Figure No. 1**



## LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- - - EXCAVATION LIMIT
- SOIL BORING/ MONITORING WELL LOCATION
- SOIL BORING LOCATION

NOTE:  
DRAWING INFORMATION TAKEN FROM AN AERIAL FROM  
HAMILTON COUNTY, CAGIS ONLINE AND AN UNDATED  
SITE PLAN PREPARED BY PETRO ENVIRONMENTAL, LLC.



GRAPHIC SCALE: 1" = 30'

Feb 01, 2013 - 6:30pm - jblake

W:\063207.09\CAD\rev1\63207.09-02.dwg



Date	2-1-13
Drawn By	JAB
Designed By	KE
Scale	1" = 30'
Project	063207.09

**SAMPLE LOCATION DIAGRAM  
FORMER SINCLAIR STATION  
800 W. WYOMING AVE.  
LOCKLAND, OHIO**

No.	Revision Date

Figure No. 2

**MW1 (4.0'–6.0')**  
 Benzene ND  
 Toluene ND  
 Ethylbenzene ND  
 Xylenes 0.0061  
 MTBE ND  
 TPH C6–C12 ND

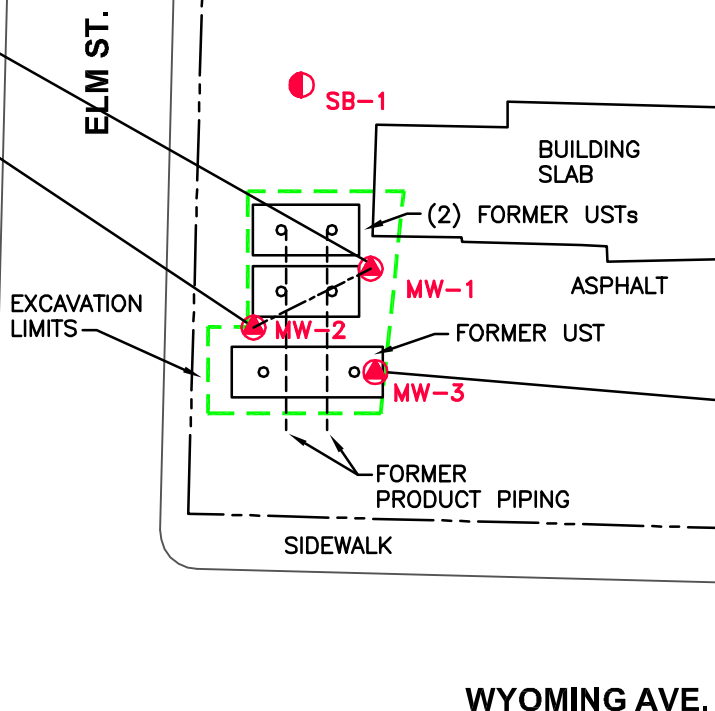
**MW1 (6.0'–8.0')**  
 Benzene 0.91  
 Toluene ND  
 Ethylbenzene ND  
 Xylenes 0.0076  
 MTBE ND  
 TPH C6–C12 2.8

**MW2 (4.0'–6.0')**  
 Benzene ND  
 Toluene 0.039  
 Ethylbenzene ND  
 Xylenes ND  
 MTBE 0.029  
 TPH C6–C12 25

**MW2 (6.0'–8.0')**  
 Benzene ND  
 Toluene 0.0098  
 Ethylbenzene ND  
 Xylenes ND  
 MTBE 0.012  
 TPH C6–C12 3.8

**MW3 (4.0'–6.0')**  
 Benzene ND  
 Toluene ND  
 Ethylbenzene ND  
 Xylenes ND  
 MTBE ND  
 TPH C6–C12 ND

**MW3 (6.0'–8.0')**  
 Benzene ND  
 Toluene ND  
 Ethylbenzene ND  
 Xylenes ND  
 MTBE ND  
 TPH C6–C12 ND



## LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- - - EXCAVATION LIMIT
- SOIL BORING/ MONITORING WELL LOCATION
- SOIL BORING LOCATION
- ND NOT DETECTED AT OR ABOVE LABORATORY REPORTING LIMITS
- MTBE METHYL TERTIARY–BUTYL ETHER
- SOIL CONCENTRATIONS IN MILLIGRAMS PER KILOGRAM (mg/kg)

NOTE:  
 DRAWING INFORMATION TAKEN FROM AN AERIAL FROM HAMILTON  
 COUNTY, CAGIS ONLINE AND AN UNDATED SITE PLAN PREPARED  
 BY PETRO ENVIRONMENTAL, LLC.

Feb 12, 2013 - 1:40pm - jblake

W:\063207.09\CAD\rev1\63207.09-04.dwg



Date	2-12-13
Drawn By	JAB
Designed By	SAR
Scale	1" = 30'
Project	063207.09

**SOIL BORING LOCATIONS, SOIL CONCENTRATIONS  
 AND SAMPLE DEPTHS  
 FORMER SINCLAIR STATION  
 800 W. WYOMING AVE.  
 LOCKLAND, OHIO**

No.	Revision Date

Figure No. 3

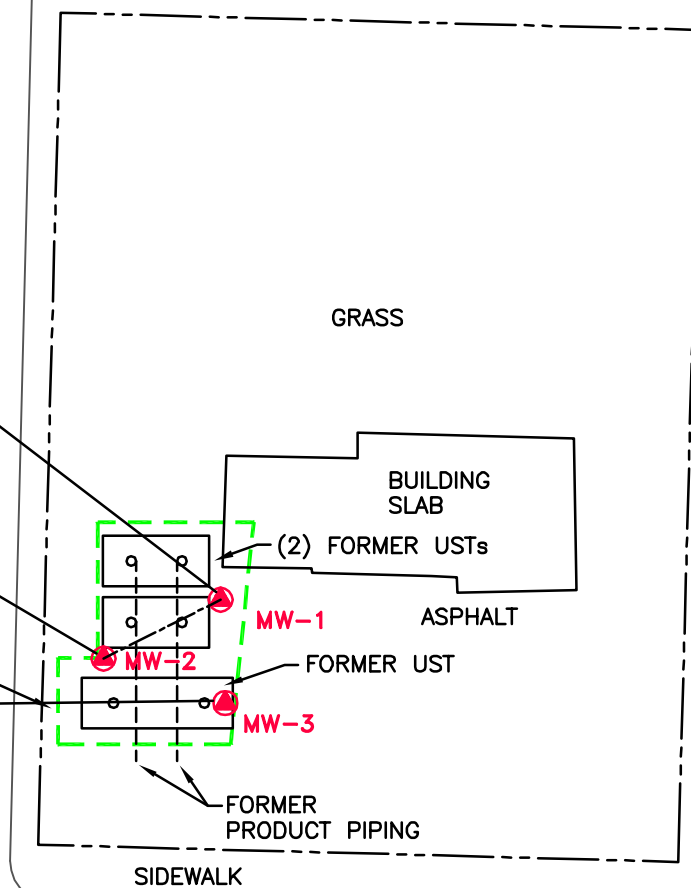
<b>MW1</b>	
Benzene	0.38
Toluene	0.15
Ethylbenzene	0.1
Xylenes	0.68
MTBE	ND

<b>MW2</b>	
Benzene	ND
Toluene	ND
Ethylbenzene	ND
Xylenes	ND
MTBE	ND

<b>MW3 (4.0'–6.0')</b>	
Benzene	0.25
Toluene	ND
Ethylbenzene	ND
Xylenes	ND
MTBE	ND

ELM ST.

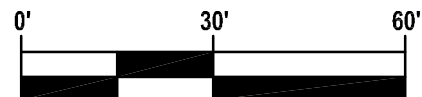
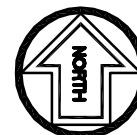
EXCAVATION LIMITS



WYOMING AVE.

## LEGEND

- APPROXIMATE PROPERTY BOUNDARY
  - - - EXCAVATION LIMIT
  - SOIL BORING/  
MONITORING WELL LOCATION
  - ND NOT DETECTED AT OR ABOVE LABORATORY REPORTING LIMITS
  - MTBE METHYL TERTIARY-BUTYL ETHER
- GROUNDWATER CONCENTRATIONS IN MILLIGRAMS PER LITER (mg/L)



GRAPHIC SCALE: 1" = 30'

NOTE:  
DRAWING INFORMATION TAKEN FROM AN AERIAL FROM HAMILTON  
COUNTY, CAGIS ONLINE AND AN UNDATED SITE PLAN PREPARED  
BY PETRO ENVIRONMENTAL, LLC.

Feb 22, 2013 - 1:24pm - jblake

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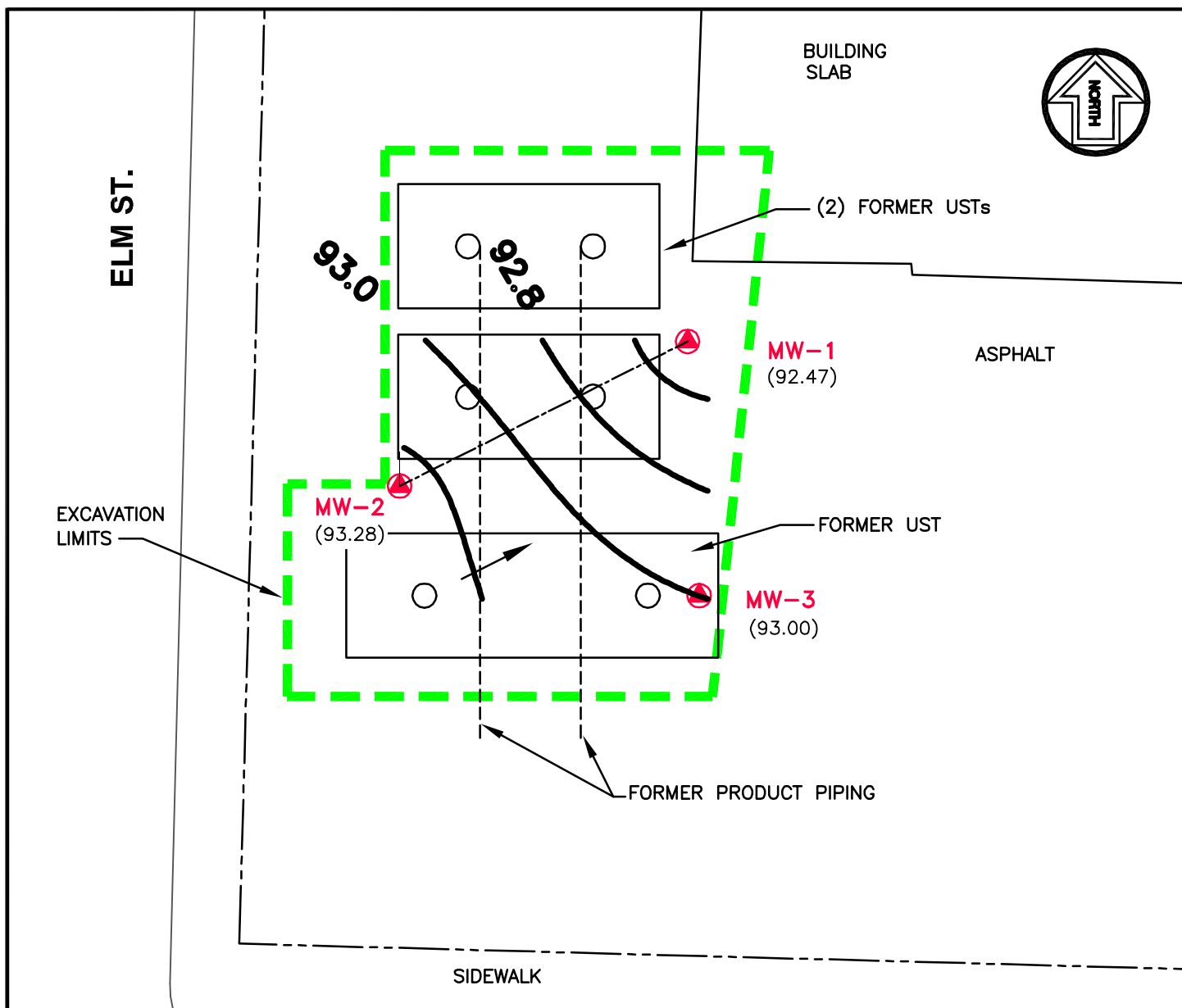


Date	2-12-13
Drawn By	JAB
Designed By	SAR
Scale	1" = 30'
Project	063207.09

**MONITORING WELLS AND  
GROUNDWATER CONCENTRATIONS  
FORMER SINCLAIR STATION  
800 W. WYOMING AVE.  
LOCKLAND, OHIO**

No.	Revision Date

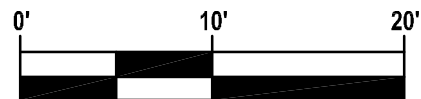
Figure No. 4



## LEGEND

- APPROXIMATE PROPERTY BOUNDARY
- - - EXCAVATION LIMIT
- SOIL BORING/  
MONITORING WELL LOCATION
- SOIL BORING LOCATION
- GROUNDWATER CONTOUR
- CONTOUR INTERVAL: 0.2 FEET

- (93.28') GROUNDWATER ELEVATION MEASURED 1/28/13
- CALCULATED HYDRAULIC GRADIENT
- $$\frac{93.28 \text{ FT} - 92.47 \text{ FT}}{20.5 \text{ FT}} = 0.04 \text{ FT/FT}$$
- DIRECTION OF GROUNDWATER FLOW



GRAPHIC SCALE: 1" = 10'

NOTE:  
DRAWING INFORMATION TAKEN FROM AN AERIAL FROM HAMILTON  
COUNTY, CAGIS ONLINE AND AN UNDATED SITE PLAN PREPARED  
BY PETRO ENVIRONMENTAL, LLC.

Feb 26, 2013 - 11:06am - jblake

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Date	2-26-13
Drawn By	JAB
Designed By	SAR
Scale	1" = 10'
Project	063207.09

**GROUNDWATER CONTOUR MAP  
FORMER SINCLAIR STATION  
800 W. WYOMING AVE.  
LOCKLAND, OHIO**

No.	Revision Date

Figure No. 5

## **APPENDICES**

*Appendix A – Soil Boring Logs*

*Appendix B – Monitoring Well Construction Diagrams*

*Appendix C – Monitoring Well Development & Sampling  
Forms*

*Appendix D – Soil Classification Form*

*Appendix E – Laboratory Analytical Report*

*Appendix F – Chains of Custody*

*Appendix G – Drinking Water Evaluation Support Documents*

## **APPENDIX A**

### ***Soil Boring Logs***



# soil and materials engineers, inc.

**PROJECT NAME:** 800 WYOMING  
**PROJECT LOCATION:** LOCKLAND, OHIO  
**CLIENT:** VILLAGE OF LOCKLAND

**A/E:** BORING SB1  
**BY:** SR  
**START:** 01/22/2013 **END:** 01/22/2013  
**PROJECT NUMBER:** 063207.09 **SHEET:** 1

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	SAMPLE RECOVERY	PID (ppm)	ANALYTICAL SAMPLE	FIELD OBSERVATIONS
0		GROUND SURFACE ELEVATION= NOT SURVEYED					
		Topsoil	S1		<1		
		Clay- Some Fine to Coarse Sand- Trace to Some Silt- Trace Brick Fragments- Moist- Black (CL/Fill)					
			S2	20	<1		
5		Clay- Some Silt- Trace to Some Fine to Coarse Sand- Moist- Gray to Brown (CL)	S3	18	<1		
		END OF BORING AT 6 FEET					
10							
15							
20							
25							
30							
35							
<b>WATER LEVEL OBSERVATIONS</b> GROUNDWATER ENCOUNTERED DURING DRILLING GROUNDWATER ENCOUNTERED UPON COMPLETION OF DRILLING			<b>Notes:</b> 1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL. 2. GROUNDWATER WAS NOT ENCOUNTERED. 3. NO ODORS WERE NOTED AND NO STAINING WAS OBSERVED.				

**DRILLER:** RH

**WATER LEVEL DURING DRILLING:**

**DRILL METHOD:** DIRECT PUSH

**BACKFILL METHOD:** SOIL CUTTINGS



# soil and materials engineers, inc.

**PROJECT NAME:** 800 WYOMING  
**PROJECT LOCATION:** LOCKLAND, OHIO  
**CLIENT:** VILLAGE OF LOCKLAND

**A/E:** BORING MW1  
**BY:** SR  
**START:** 01/21/2013 **END:** 01/21/2013  
**PROJECT NUMBER:** 063207.09 **SHEET:** 1

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	SAMPLE RECOVERY	PID (ppm)	ANALYTICAL SAMPLE	FIELD OBSERVATIONS
0		GROUND SURFACE ELEVATION= NOT SURVEYED					
0		Fine to Coarse Sand and Gravel- Trace to Some Silt- Trace Brick- Moist- Brown (SP/Fill)	S1		<1		
		Coarse Sand- Little Silt- Trace Clay and Root Fragments- Moist- Brown (SP/Fill)	S2	12	<1		
5			S3	20	1.3		
			S3	18	<1		
		Silt- Some Fine to Coarse Sand- Moist- Gray (SM)	S4	18	<1		WET AT 8.5 FEET
10			S5	20	<1		
			S6	18	<1		
15			S7	18	<1		
			S8	16	<1		
20			S9	12	<1		
		Clay- Some Silt- Trace to Some Fine to Coarse Sand- Moist- Gray (CL)	S10	24	<1		
25			S11	24	<1		
			S12	24	<1		
			S13	24	<1		
30		END OF BORING AT 30 FEET	S14	24	<1		
35							
WATER LEVEL OBSERVATIONS		Notes: 1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL. 2. A GROUNDWATER SAMPLE WAS COLLECTED FROM A MONITORING WELL INSTALLED IN AN OFFSET BOREHOLE; THE WELL SCREEN WAS SET BETWEEN 7 FEET AND 17 FEET BELOW GROUND SURFACE. 3. NO ODORS WERE NOTED AND NO STAINING WAS OBSERVED.					
GROUNDWATER ENCOUNTERED DURING DRILLING GROUNDWATER ENCOUNTERED UPON COMPLETION OF DRILLING							

**DRILLER:** RH

**WATER LEVEL DURING DRILLING:** 8.5'

**DRILL METHOD:** DIRECT PUSH

**BACKFILL METHOD:** SOIL CUTTINGS



**A/E: BORING MW2**  
**START: 01/22/2013 END: 01/22/20113**  
**063207.09 SHEET: 1**

DRILLER: RH WATER LEVEL DURING DRILLING: 8'

DRILL METHOD: DIRECT PUSH BACKFILL METHOD: SOIL CUTTINGS



# soil and materials engineers, inc.

**PROJECT NAME:** 800 WYOMING  
**PROJECT LOCATION:** LOCKLAND, OHIO  
**CLIENT:** VILLAGE OF LOCKLAND

**A/E:** BORING MW3  
**BY:** SR  
**START:** 01/22/2013 **END:** 01/22/2013  
**PROJECT NUMBER:** 063207.09 **SHEET:** 1

DEPTH (FEET)	SYMBOLIC PROFILE	PROFILE DESCRIPTION	SAMPLE TYPE/NUMBER INTERVAL	SAMPLE RECOVERY	PID (ppm)	ANALYTICAL SAMPLE	FIELD OBSERVATIONS
0		GROUND SURFACE ELEVATION= NOT SURVEYED					
0		Fine to Coarse Sand- Some Gravel- Trace Silt- Moist- Brown (SP/Fill)	S1	2.1			
			S2	6	<1		
5		Fine to Coarse Sand- Trace to Some Silt- Moist- Brown (SP/Fill)	S3	20	11.0		
			S3	20	<1		
10			S4	18	1494		
			S5	20	28.6		
		Silt- Some Fine to Coarse Sand- Wet- Gray (SM)	S6	18	4.1		
15		Clay- Some Silt- Trace to Some Fine to Coarse Sand- Moist- Gray (CL)	S7	20	7.1		
		END OF BORING AT 16 FEET					
20							
25							
30							
35							
<b>WATER LEVEL OBSERVATIONS</b> GROUNDWATER ENCOUNTERED DURING DRILLING GROUNDWATER ENCOUNTERED UPON COMPLETION OF DRILLING			<b>Notes:</b> 1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL. 2. A GROUNDWATER SAMPLE WAS COLLECTED FROM A MONITORING WELL INSTALLED IN THE BOREHOLE; THE WELL SCREEN WAS SET BETWEEN 6 FEET AND 16 FEET BELOW GROUND SURFACE.				

**DRILLER:** RH

**WATER LEVEL DURING DRILLING:** 8'

**DRILL METHOD:** DIRECT PUSH

**BACKFILL METHOD:** SOIL CUTTINGS

## **APPENDIX B**

### ***Monitoring Well Construction Diagrams***



# soil and materials engineers, inc.

## MONITORING WELL LOG SME PROJECT No. 063207.09

Monitoring Well

MW1

**PROJECT NAME:** 800 WYOMING  
**PROJECT LOCATION:** LOCKLAND, OHIO  
**CLIENT:** VILLAGE OF LOCKLAND

**BY:** SR

**DATE:** 01/21/2013

ELEVATION (Ft.)	WELL DIAGRAM	DEPTH (Ft.)	PROFILE	PROFILE DESCRIPTION	WELL CONSTRUCTION DETAILS			
		0		GROUND SURFACE ELEVATION IN FEET = NOT SURVEYED				
				Fine to Coarse Sand and Gravel- Trace to Some Silt- Trace Brick- Moist- Brown (SP/Fill)	<b>Top of Casing</b> Elevation: 100.32			
		5		Coarse Sand- Little Silt- Trace Clay and Root Fragments- Moist- Brown (SP/Fill)	<b>Well Screen Tip</b> Elevation:			
				Silt- Some Fine to Coarse Sand- Moist- Gray (SM)	<b>Borehole Diameter:</b> 6" <b>Filter Pack Type:</b> GLOBAL FILTER SAND			
		10			<b>Well Casing</b> <b>Diameter:</b> 2" <b>Length:</b> 6.5' <b>Type:</b> PVC <b>Joint Type:</b> SCREW-IN			
		15			<b>Well Screen</b> <b>Diameter:</b> 2" <b>Length:</b> 10' <b>Type:</b> PVC <b>Mesh:</b> 0.10" <b>Screen Plug (Y/N):</b> Y			
		20		Clay- Some Silt- Trace to Some Fine to Coarse Sand- Moist- Gray (CL)	<b>Protective Casing</b> <b>Total Length:</b> 0.5 <b>Length Above Ground:</b> 0 <b>Diameter:</b> 6" <b>Type:</b> FLUSH MOUNT COVER			
		25			<b>Well Cap</b> <b>Type:</b>			
		30		END OF BORING AT 30 FEET	<b>Northing:</b> <b>Easting:</b>			
		35						
<b>WELL TYPE:</b> MONITORING <b>DRILLER:</b> RH <b>RIG NUMBER OR CONTRACTOR:</b>			<b>DRILLING METHOD:</b> DIRECT PUSH GROUNDWATER DURING DRILLING GROUNDWATER AFTER DRILLING					
<b>Notes:</b> 1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL. 2. A GROUNDWATER SAMPLE WAS COLLECTED FROM A MONITORING WELL INSTALLED IN AN OFFSET BOREHOLE; THE WELL SCREEN WAS SET BETWEEN 7 FEET AND 17 FEET BELOW GROUND SURFACE. 3. NO ODORS WERE NOTED AND NO STAINING WAS OBSERVED.								
<b>WATER LEVEL DATA</b>								
<b>DATE</b>	<b>DEPTH (Feet)</b>	<b>ELEVATION (Feet)</b>						
01/22/2013	8.5'							
01/22/2013	10.5'							



# soil and materials engineers, inc.

## MONITORING WELL LOG

### SME PROJECT No. 063207.09

Monitoring Well

MW2

**PROJECT NAME:** 800 WYOMING  
**PROJECT LOCATION:** LOCKLAND, OHIO  
**CLIENT:** VILLAGE OF LOCKLAND

**BY:** SR

**DATE:** 01/22/2013

ELEVATION (Ft.)	WELL DIAGRAM	DEPTH (Ft.)	PROFILE	PROFILE DESCRIPTION	WELL CONSTRUCTION DETAILS			
		0		GROUND SURFACE ELEVATION IN FEET = NOT SURVEYED				
				Fine to Coarse Sand- Some Gravel- Trace Silt- Moist- Brown (SP/Fill)	Top of Casing Elevation: 100			
		5		Silt- Some Fine Sand- Trace Clay and Gravel- Moist- Dark Brown (SP/Fill)	Well Screen Tip Elevation:  Borehole Diameter: 6" Filter Pack Type: GLOBAL FILTER SAND			
		10		Fine to Coarse Sand- Trace Silt- Wet- Brown (SP/FILL)	Well Casing Diameter: 2" Length: 5.5' Type: PVC			
		15		Clay- Some Silt- Trace to Some Fine to Coarse Sand- Moist- Gray (CL)	Joint Type: SCREW-IN  Well Screen Diameter: 2" Length: 10' Type: PVC			
				END OF BORING AT 16 FEET	Mesh: .010" Screen Plug (Y/N): Y			
		20			Protective Casing Total Length: 0.5' Length Above Ground: 0 Diameter: 6" Type: FLUSH MOUNT			
		25			Well Cap Type:			
		30			Northing: Easting:			
		35						
<b>WELL TYPE:</b> MONITORING <b>DRILLER:</b> RH <b>RIG NUMBER OR CONTRACTOR:</b>			<b>DRILLING METHOD:</b> DIRECT PUSH <b>GROUNDWATER DURING DRILLING</b> <b>GROUNDWATER AFTER DRILLING</b>					
<b>Notes:</b> 1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL. 2. A GROUNDWATER SAMPLE WAS COLLECTED FROM A MONITORING WELL INSTALLED IN THE BOREHOLE; THE WELL SCREEN WAS SET BETWEEN 6 FEET AND 16 FEET BELOW GROUND SURFACE. 3. NO ODORS WERE NOTED AND NO STAINING WAS OBSERVED.								
<b>WATER LEVEL DATA</b>								
DATE	DEPTH (Feet)	ELEVATION (Feet)						
01/22/2013	8'							



# soil and materials engineers, inc.

## MONITORING WELL LOG SME PROJECT No. 063207.09

Monitoring Well

MW3

**PROJECT NAME:** 800 WYOMING  
**PROJECT LOCATION:** LOCKLAND, OHIO  
**CLIENT:** VILLAGE OF LOCKLAND

**BY:** SR

**DATE:** 01/22/2013

ELEVATION (Ft.)	WELL DIAGRAM	DEPTH (Ft.)	PROFILE	PROFILE DESCRIPTION	WELL CONSTRUCTION DETAILS
		0		GROUND SURFACE ELEVATION IN FEET = NOT SURVEYED	
				Fine to Coarse Sand- Some Gravel- Trace Silt- Moist- Brown (SP/Fill)	Top of Casing Elevation: 99.91'
		5		Fine to Coarse Sand- Trace to Some Silt- Moist- Brown (SP/Fill)	Well Screen Tip Elevation:
		10			Borehole Diameter: 6"
					Filter Pack Type: GLOBAL FILTER SAND
		15		Silt- Some Fine to Coarse Sand- Wet- Gray (SM)	Well Casing Diameter: 2"
				Clay- Some Silt- Trace to Some Fine to Coarse Sand- Moist- Gray (CL)	Length: 5.5'
				END OF BORING AT 16 FEET	Type: PVC
		20			Joint Type: SCREW-IN
		25			Well Screen Diameter: 2"
		30			Length: 10'
		35			Type: PVC
					Mesh: .010"
					Screen Plug (Y/N): Y
					Protective Casing Total Length: 0.5'
					Length Above Ground: 0
					Diameter: 6:
					Type: FLUSH MOUNT
					Well Cap Type:
					Northing:
					Easting:

**WELL TYPE:** MONITORING  
**DRILLER:** RH  
**RIG NUMBER OR CONTRACTOR:**

**DRILLING METHOD:** DIRECT PUSH  
**GROUNDWATER DURING DRILLING**  
**GROUNDWATER AFTER DRILLING**

### Notes:

1. THE INDICATED STRATIFICATION LINES ARE APPROXIMATE. IN SITU, THE TRANSITION BETWEEN MATERIALS MAY BE GRADUAL.
2. A GROUNDWATER SAMPLE WAS COLLECTED FROM A MONITORING WELL INSTALLED IN THE BOREHOLE; THE WELL SCREEN WAS SET BETWEEN 6 FEET AND 16 FEET BELOW GROUND SURFACE.

### WATER LEVEL DATA

DATE	DEPTH (Feet)	ELEVATION (Feet)
01/21/2013	8'	
01/22/2013	7.2'	

## **APPENDIX C**

### ***Monitoring Well Development & Sampling Forms***





# WELL DEVELOPMENT FIELD REPORT SOIL AND MATERIALS ENGINEERS, INC.

Project Name: 800 Wagon  
 SME Project No.: 06320709  
 Sampling Personnel: SK  
 Time Well Was Opened: 0830  
 Time of Measurement: 1010  
 Depth to Water (\*): 6.91'  
 Depth to Bottom of Well (\*): 16.6'

Well ID: mw3  
 Date: 1-28-12  
 Weather: 45, overcast  
 Water Quality Meter: Oratech  
 Product present? (Y or N) (N)  
 If "Y", depth to Product (\*): -  
 Approx. Pump/Tubing Inlet Depth (\*): Bailer

Well Condition OK? (circle as applicable): Well cover?: (Y) or N ) Lock?: (Y) or N ) Well Cap?: (Y) or N )  
 If "N", explain: \_\_\_\_\_

Time Purging Began: 1015 \* = Measured feet from Top-of-Casing (TOC)

Time	Approx. Purge Rate (mL/min)	Depth To Water (feet) [0.33 feet drawdown]	Temp. (Deg. C) [ ± 0.2]	Conductivity (µS/cm) [ ± 3 % ]	pH (s.u.) [ ± 0.1 s.u.]	ORP (mV) [ ± 10mV]	Turbidity (NTUs) [ ± 10% or <20 NTU]	DO (mg/l) [ ± 10%]
1015	300	6.91	14.2	1011	7.7			
1020	300	7.29	13.7	1030	7.5			
1025	300	7.52	13.5	1023	7.6			
1030	300	7.79	13.5	1029	7.5			
1035	300	8.12	13.5	1020	7.6			
1040	300	8.38	13.6	1021	7.6			
Total Drawdown		1.47'	[Bracketed Values] = Field Verification of Stabilization (FVS) Target					
Calculated FVS***			0.1	0.7%	0.1			
Stable? Y or N (last 3 readings)			Y	Y	Y			

SAMPLE TIME: 1045

Note: For simplicity, "sample time" is time sampling began AND time on samples AND time on chains.

Purge Duration (sample time minus time purge began): 3 min

Volume GW Purged: 3.0 gal

Water Color/Siltiness: clear

Sheen: (Y or N) (N) Odor: (Y or N) (N) if Y, describe: \_\_\_\_\_

Well Sampling Notes: \_\_\_\_\_

\*\*\*Calculated FVS = [Max-Min] for pH, ORP, and Temp  
 [(Max-Min)/Min] for Cond., DO, and Turb

## **APPENDIX D**

### ***Soil Classification Form***

## BUSTR SOIL CLASSIFICATION FORM

Major Divisions			Letter Symbol	Typical Description	Soil Class
<b>Coarse Grained Soils</b>  More than 50% of material is retained on #200 Sieve	<b>Gravel and Gravelly Soils</b>  More than 50% of Coarse Fraction Retained on No. 4 Sieve	<b>Clean Gravels</b> (Little or No Fines)	GW	Well-Graded Gravels, Gravel-Sand Mixtures, Little or No Fines	Class 1
			GP	Poorly-Graded Gravels, Gravel-Sand Mixtures, Little or No Fines	
		<b>Gravels with Fines</b> (Appreciable Amount of Fines)	GM	Silty Gravels, Gravel-Sand-Silt Mixtures	
			GC	Clayey Gravels, Gravel-Sand-Clay Mixtures	
	<b>Sand and Sandy Soils</b>  More than 50% of Coarse Fraction Passes thru No. 4 Sieve	<b>Clean Sand</b> (Little or No Fines)	SW	Well-Graded Sands, Gravelly Sands, Little or No Fines	
			SP	Poorly-Graded Sands, Gravelly Sands, Little or No Fines	
		<b>Sands with Fines</b> (Appreciable Amount of Fines)	SM	Silty-Sands, Sand-Silt Mixtures	
			SC	Clayey Sands, Sand-Clay Mixtures	
<b>Fine Grained Soils</b>  More than 50% of material passes thru #200 Sieve	<b>Silts and Clays</b>  Liquid Limit<50		ML	Inorganic Silt and Very Fine Sands, Rock Flour, Silty or Clayey Fine Sand or Clayey Silts with Slight Plasticity	Class 2
			CL	Inorganic Clays of Low to Medium Plasticity, Gravelly Clays, Sandy Clays, Silty Clays, Lean Clays	
			OL	Organic Silts and Organic Silty Clays of Low Plasticity	
	<b>Silts and Clays</b>  Liquid Limit>50		MH	Inorganic Silts, Micaceous or Diatomaceous Fine Sand or Silty Soil	Class 3
			CH	Inorganic Clays of High Plasticity, Fat Clays	
			OH	Organic Clays of Medium to Plasticity, Organic Silts	
	<b>Highly Organic Soils</b>			PT	Peat, Humus, Swamp Soil with High Organic Contents

Pathway	Symbol	Pathway	Symbol
Soil to DW Leaching	CL	GW to Indoor Air	CL
Soil to Indoor Air	CL	Soil to Non-DW Leaching	CL

I have inspected the soil at: 800 Wyoming Avenue, Lockland, Ohio.  
(address) (city)

Name (Printed): Steven A Reutter, Staff Geologist, Soil and Materials Engineers. Date: 02/20/2013  
(Name of Classifier, Title, Firm Name)

Signature: Sten B. [Signature]



9375 Chillicothe Road  
Kirtland, Ohio  
44094-8501  
Phone: 440-256-6500  
Fax: 440-256-6507  
www.sme-usa.com

Soil and Materials Engineers, Inc.

## LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX ASTM D4318 - A

**PROJECT:** 800 Wyoming Avenue  
**LOCATION:** Cincinnati, Ohio  
**PROJECT#:** 063207.09  
**DATE:** January 25, 2013

**DATE OBTAINED:** January 22, 2013  
**SAMPLE NUMBER:** 8833  
**SAMPLE LOCATION:** SB1; 2' - 4'  
**SAMPLE DESCRIPTION:** Brown and gray lean CLAY  
**TECHNICIAN:** CNW

**TEST METHOD:** ASTM D4318  
**METHOD - A**

### TEST DATA:

#### LIQUID LIMIT

Point #:	1	2	3
Wet Wt + Tare, g:	47.58	47.27	47.42
Dry Wt + Tare, g:	44.16	44.19	44.33
Tare Wt.:	34.33	34.59	34.21
Water Content:	34.79	32.08	30.53
Number of Blows:	15	26	35

Water Content corrected for method B:	32
---------------------------------------	----

#### PLASTIC LIMIT TEST

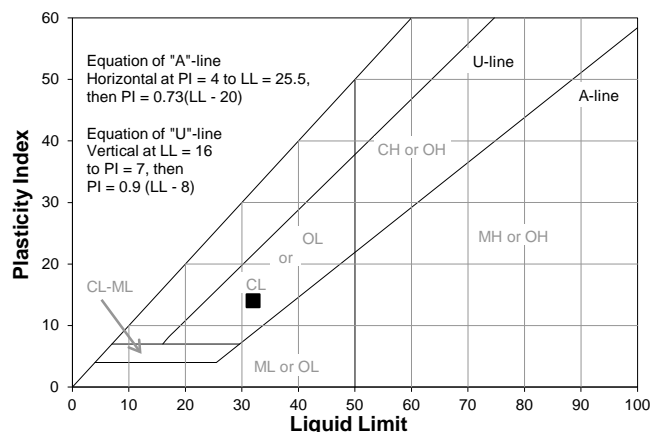
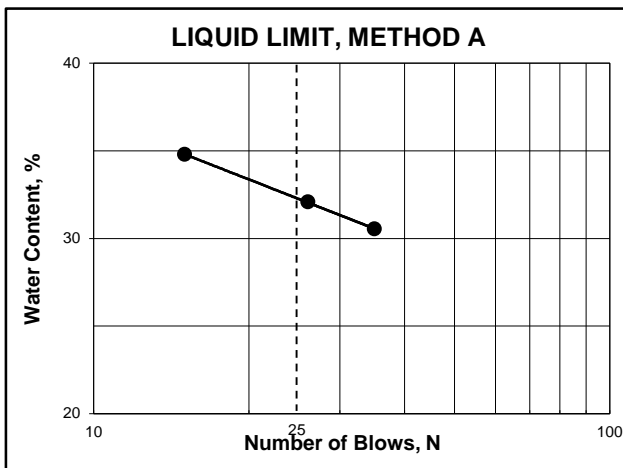
Wet Wt + Tare, g:	41.62	44.03
Dry Wt + Tare, g:	40.51	42.88
Tare Wt, g:	34.45	36.65
Water Content:	18.32	18.46

#### PLASTICITY INDEX

<b>LIQUID LIMIT:</b>	32
<b>PLASTIC LIMIT:</b>	18
<b>PLASTICITY INDEX:</b>	14

**CLASSIFICATION: CL**

**REMARKS:** Sample air dried prior to testing





Soil and Materials Engineers, Inc.

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Kirtland, Ohio  
44094-8501

Phone: 440-256-6500  
Fax: 440-256-6507  
www.sme-usa.com

## LIQUID LIMIT, PLASTIC LIMIT & PLASTICITY INDEX ASTM D4318 - A

**PROJECT:** 800 Wyoming Avenue  
**LOCATION:** Cincinnati, Ohio  
**PROJECT#:** 063207.09  
**DATE:** January 25, 2013

**DATE OBTAINED:** January 22, 2013  
**SAMPLE NUMBER:** 8834  
**SAMPLE LOCATION:** SB1; 4' - 6'  
**SAMPLE DESCRIPTION:** Brown and gray lean CLAY  
**TECHNICIAN:** CNW

**TEST METHOD:** ASTM D4318  
**METHOD - A**

### TEST DATA:

#### LIQUID LIMIT

Point #:	1	2	3
Wet Wt + Tare, g:	47.78	49.47	46.68
Dry Wt + Tare, g:	44.52	45.93	43.89
Tare Wt.:	34.25	34.42	34.32
Water Content:	31.74	30.76	29.15
Number of Blows:	17	23	35

Water Content  
corrected for method B:

30

#### PLASTIC LIMIT TEST

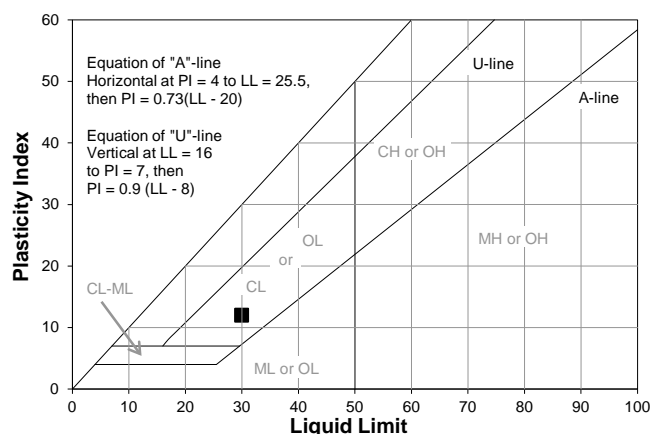
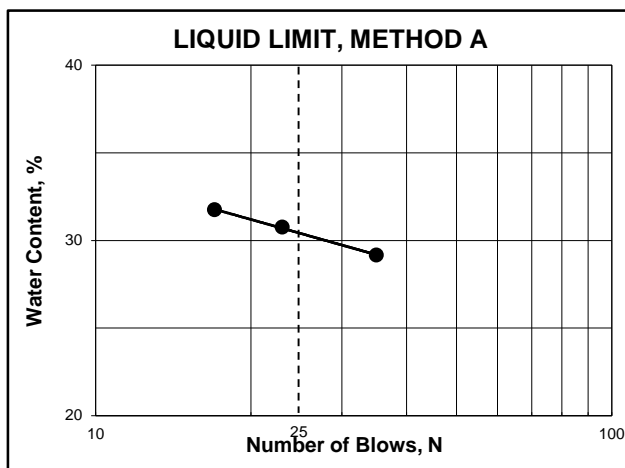
Wet Wt + Tare, g:	41.48	41.10
Dry Wt + Tare, g:	40.42	40.04
Tare Wt, g:	34.47	34.15
Water Content:	17.82	18.00

#### PLASTICITY INDEX

LIQUID LIMIT:	30
PLASTIC LIMIT:	18
PLASTICITY INDEX:	12

**CLASSIFICATION: CL**

**REMARKS:** Sample air dried prior to testing

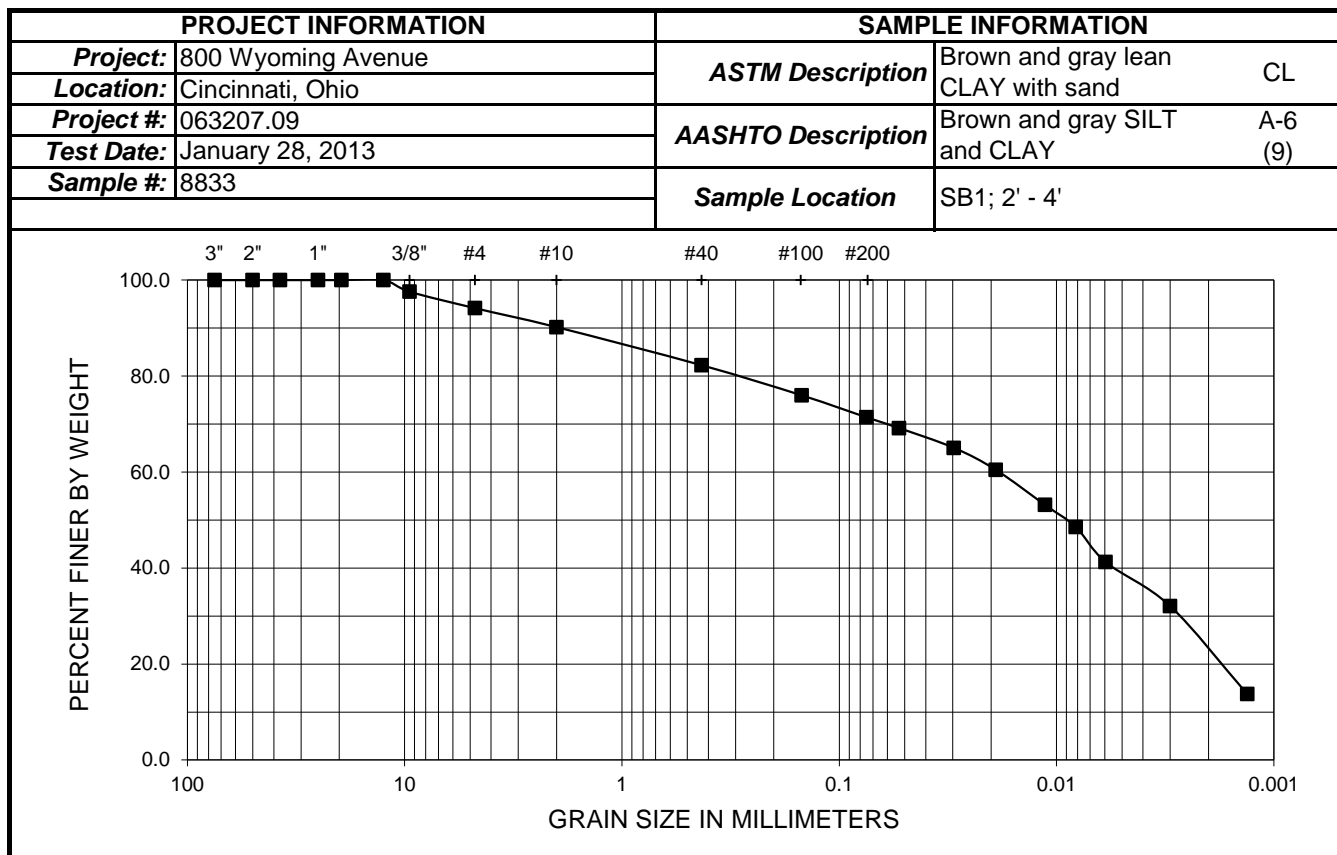




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Soil and Materials Engineers, Inc.

# PARTICLE SIZE ANALYSIS WITH HYDROMETER ASTM D422



## SIEVE ANALYSIS

Sieve #	Sieve size, mm	Percent Passing
3"	75	100.0
2"	50	100.0
1-1/2"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	97.6
#4	4.75	94.2
#10	2	90.2
#40	0.43	82.3
#100	0.15	76.0
#200	0.074	71.4
#270	0.053	69.2

## HYDROMETER ANALYSIS

Particle Size	Percent Passing
0.074 mm	71.4
0.053 mm	69.2
0.005 mm	38.9
0.0013 mm	13.7

## ATTERBERG LIMITS

LIQUID LIMIT	32
PLASTIC LIMIT	18
PLASTICITY INDEX	14

## PARTICLE DISTRIBUTION

D <sub>10</sub>	NA	mm
D <sub>30</sub>	0.003	mm
D <sub>60</sub>	0.018	mm
C <sub>c</sub>	NA	
C <sub>u</sub>	NA	

## DISPERSION

Device	ASTM D422, Type A
Agent	Sodium Hexametaphosphate
Time in Agent	16 Hours

## SAND AND GRAVEL DESCRIPTION

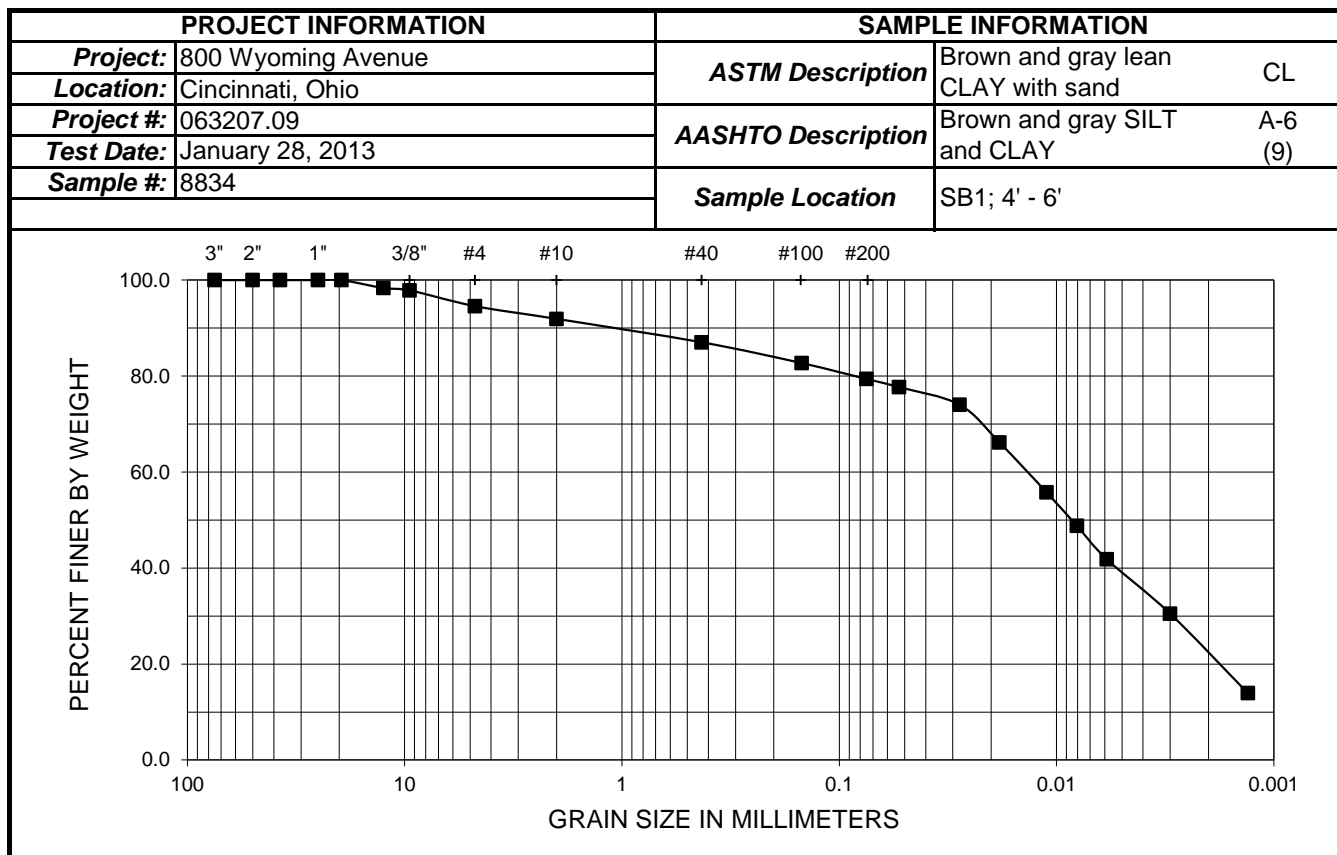
SHAPE	Angular
HARDNESS	Hard and durable



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Soil and Materials Engineers, Inc.

# PARTICLE SIZE ANALYSIS WITH HYDROMETER ASTM D422



## SIEVE ANALYSIS

Sieve #	Sieve size, mm	Percent Passing
3"	75	100.0
2"	50	100.0
1-1/2"	37.5	100.0
1"	25	100.0
3/4"	19	100.0
3/8"	9.5	97.9
#4	4.75	94.6
#10	2	91.9
#40	0.43	87.0
#100	0.15	82.7
#200	0.074	79.4
#270	0.053	77.7

## HYDROMETER ANALYSIS

Particle Size	Percent Passing
0.074 mm	79.4
0.053 mm	77.7
0.005 mm	39.1
0.0013 mm	13.9

## ATTERBERG LIMITS

LIQUID LIMIT	30
PLASTIC LIMIT	18
PLASTICITY INDEX	12

## PARTICLE DISTRIBUTION

D <sub>10</sub>	NA	mm
D <sub>30</sub>	0.003	mm
D <sub>60</sub>	0.014	mm
C <sub>c</sub>	NA	
C <sub>u</sub>	NA	

## DISPERSION

Device	ASTM D422, Type A
Agent	Sodium Hexametaphosphate
Time in Agent	16 Hours

## SAND AND GRAVEL DESCRIPTION

SHAPE	Angular
HARDNESS	Hard and durable

# PERCENT ORGANICS ASTM D2974

<b>PROJECT:</b>	800 Wyoming Avenue	<b>DATE:</b>	January 28, 2013
<b>LOCATION:</b>	Cincinnati, Ohio	<b>PROJECT #:</b>	063207.09
<b>TECHNICIAN:</b>	CNW	<b>OVEN SERIAL#:</b>	1285040920133

TEST NUMBER	1	2		
<b>SAMPLE NUMBER</b>	8833	8834		
<b>SAMPLE DESCRIPTION</b>	Brown and gray lean CLAY	Brown and gray lean CLAY		
<b>SAMPLE LOCATION</b>	SB1; 2' - 4'	SB1; 4' - 6'		
<b>TARE NUMBER</b>	L6	17		
<b>TARE WEIGHT</b>	50.82	38.59		
<b>WET SOIL + TARE</b>	137.84	143.32		
<b>METHOD A</b>	<b>WATER CONTENT</b>			
<b>DRY SOIL + TARE</b>	126.58	129.41		
<b>PERCENT MOISTURE</b>	14.9	15.3		
<b>METHOD C</b>	<b>PERCENT ORGANICS</b>			
<b>ASH WEIGHT + TARE</b>	123.98	126.63		
<b>PERCENT ORGANICS</b>	3.4	3.1		
<b>METHOD D</b>	<b>PERCENT ORGANICS</b>			
<b>ASH WEIGHT + TARE</b>	122.17	124.71		
<b>PERCENT ORGANICS</b>	5.8	5.2		

TEST NUMBER				
<b>SAMPLE NUMBER</b>				
<b>SAMPLE DESCRIPTION</b>				
<b>SAMPLE LOCATION</b>				
<b>TARE NUMBER</b>				
<b>TARE WEIGHT</b>				
<b>WET SOIL + TARE</b>				
<b>METHOD A</b>	<b>WATER CONTENT</b>			
<b>DRY SOIL + TARE</b>				
<b>PERCENT MOISTURE</b>				
<b>METHOD C</b>	<b>PERCENT ORGANICS</b>			
<b>ASH WEIGHT + TARE</b>				
<b>PERCENT ORGANICS</b>				
<b>METHOD D</b>	<b>PERCENT ORGANICS</b>			
<b>ASH WEIGHT + TARE</b>				
<b>PERCENT ORGANICS</b>				

REMARKS:

Method C- Geotechnical and classification purposes.  
Method D- Peats for use as fuel and total carbon.

## **APPENDIX E**

### ***Laboratory Analytical Report***



06-Feb-2013

Keith Egan  
Soil and Materials Engineers  
One N. Commerce Park Drive, Suite 113  
Cincinnati, OH 45215

Tel: (513) 319-8918  
Fax:

Re: 800 Wyoming; Project No.: 063207.09

Work Order: **1301350**

Dear Keith,

ALS Environmental received 2 samples on 23-Jan-2013 08:47 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 11.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Jeff Ogle

Electronically approved by: Jeff Ogle

Jeff Ogle  
Laboratory Director

ADDRESS 4388 Glendale Milford Rd Cincinnati, Ohio 45242- | PHONE (513) 733-5336 | FAX (513) 733-5347

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Environmental

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RIGHT SOLUTIONS RIGHT PARTNER

**Client:** Soil and Materials Engineers  
**Project:** 800 Wyoming; Project No.: 063207.09  
**Work Order:** 1301350

Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Dat</u>	<u>Date Received</u>	<u>Hold</u>
1301350-01	MW1 4-6	Soil		1/21/2013 16:00	1/23/2013 08:47	<input type="checkbox"/>
1301350-02	MW1 6-8	Soil		1/21/2013 16:55	1/23/2013 08:47	<input type="checkbox"/>

---

**Client:** Soil and Materials Engineers  
**Project:** 800 Wyoming; Project No.: 063207.09  
**Work Order:** 1301350

---

**Case Narrative**

The analytical data provided relates directly to the samples received by ALS Laboratory Group and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

**ALS Environmental**

Date: 06-Feb-13

**Client:** Soil and Materials Engineers  
**Project:** 800 Wyoming; Project No.: 063207.09  
**Sample ID:** MW1 4-6  
**Collection Date:** 1/21/2013 04:00 PM

**Work Order:** 1301350  
**Lab ID:** 1301350-01  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>GASOLINE RANGE ORGANICS (C6-C12)</b>			<b>SW8015A</b>			Analyst: <b>TJH</b>
TPH C6-C12	ND		2.2	mg/Kg-dry	1	1/25/2013 12:11 AM
Surr: Cyclooctane	108		55-135	%REC	1	1/25/2013 12:11 AM
<b>VOLATILES BY GC-PID</b>			<b>SW8021</b>			Analyst: <b>TJH</b>
Methyl tert-butyl ether	ND		0.011	mg/Kg-dry	1	2/3/2013 02:44 PM
Benzene	ND		0.0056	mg/Kg-dry	1	2/3/2013 02:44 PM
<b>Toluene</b>	<b>0.0061</b>		<b>0.0056</b>	<b>mg/Kg-dry</b>	1	2/3/2013 02:44 PM
Ethylbenzene	ND		0.0056	mg/Kg-dry	1	2/3/2013 02:44 PM
Xylenes, Total	ND		0.0056	mg/Kg-dry	1	2/3/2013 02:44 PM
Surr: Tetrachloroethene	109		81-118	%REC	1	2/3/2013 02:44 PM
<b>MOISTURE</b>			<b>SM2540B</b>		Prep Date: <b>1/23/2013</b>	Analyst: <b>YCL</b>
Moisture	11		0.010	% of sample	1	1/23/2013

---

**Note:**

**ALS Environmental**

Date: 06-Feb-13

**Client:** Soil and Materials Engineers  
**Project:** 800 Wyoming; Project No.: 063207.09  
**Sample ID:** MW1 6-8  
**Collection Date:** 1/21/2013 04:55 PM

**Work Order:** 1301350  
**Lab ID:** 1301350-02  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>GASOLINE RANGE ORGANICS (C6-C12)</b>			<b>SW8015A</b>			Analyst: <b>TJH</b>
TPH C6-C12	2.8		2.2	mg/Kg-dry	1	1/25/2013 12:41 AM
Surr: Cyclooctane	99.3		55-135	%REC	1	1/25/2013 12:41 AM
<b>VOLATILES BY GC-PID</b>			<b>SW8021</b>			Analyst: <b>TJH</b>
Methyl tert-butyl ether	ND		0.011	mg/Kg-dry	1	2/3/2013 03:13 PM
Benzene	0.91		0.0055	mg/Kg-dry	1	2/3/2013 03:13 PM
Toluene	0.0076		0.0055	mg/Kg-dry	1	2/3/2013 03:13 PM
Ethylbenzene	ND		0.0055	mg/Kg-dry	1	2/3/2013 03:13 PM
Xylenes, Total	ND		0.0055	mg/Kg-dry	1	2/3/2013 03:13 PM
Surr: Tetrachloroethene	103		81-118	%REC	1	2/3/2013 03:13 PM
<b>MOISTURE</b>			<b>SM2540B</b>		Prep Date: 1/23/2013	Analyst: <b>YCL</b>
Moisture	8.3		0.010	% of sample	1	1/23/2013

---

**Note:**

# ALS Environmental

Date: 06-Feb-13

**Client:** Soil and Materials Engineers

**Work Order:** 1301350

**Project:** 800 Wyoming; Project No.: 063207.09

## QC BATCH REPORT

Batch ID: **R96701** Instrument ID **GC6** Method: **SW8015A**

<b>MBLK</b>	Sample ID: <b>BLK-R96701</b>			Units: <b>mg/Kg</b>			Analysis Date: <b>1/24/2013 08:26 PM</b>			
Client ID:	Run ID: <b>GC6_130124C</b>			SeqNo: <b>560537</b>			Prep Date:		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

TPH C6-C12	ND	2.0								
Surr: Cyclooctane	100.3	0	100	0	100	55-135	0			

<b>LCS</b>	Sample ID: <b>LCS-R96701</b>			Units: <b>mg/Kg</b>			Analysis Date: <b>1/24/2013 09:26 PM</b>			
Client ID:	Run ID: <b>GC6_130124C</b>			SeqNo: <b>560538</b>			Prep Date:		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

TPH C6-C12	19.36	2.0	20	0	96.8	69.5-120	0			
Surr: Cyclooctane	118	0	100	0	118	55-135	0			

<b>MS</b>	Sample ID: <b>1301351-03A MS</b>			Units: <b>mg/Kg</b>			Analysis Date: <b>1/25/2013 02:40 AM</b>			
Client ID:	Run ID: <b>GC6_130124C</b>			SeqNo: <b>560544</b>			Prep Date:		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

TPH C6-C12	16.35	2.0	20	1.199	75.7	28.8-111	0			
Surr: Cyclooctane	109.2	0	100	0	109	55-135	0			

<b>MSD</b>	Sample ID: <b>1301351-03A MSD</b>			Units: <b>mg/Kg</b>			Analysis Date: <b>1/25/2013 03:10 AM</b>			
Client ID:	Run ID: <b>GC6_130124C</b>			SeqNo: <b>560545</b>			Prep Date:		DF: <b>1</b>	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual

TPH C6-C12	16.65	2.0	20	1.199	77.3	22.5-117	16.35	1.87	15.7	
Surr: Cyclooctane	111.5	0	100	0	111	55-135	109.2	2.05		

The following samples were analyzed in this batch:

1301350-01A	1301350-02A
-------------	-------------

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Soil and Materials Engineers  
**Work Order:** 1301350  
**Project:** 800 Wyoming; Project No.: 063207.09

## QC BATCH REPORT

Batch ID: **R96779** Instrument ID **GC6** Method: **SW8021**

<b>MBLK</b>		Sample ID: <b>BLK-R96779</b>		Units: <b>mg/Kg</b>		Analysis Date: <b>2/3/2013 12:45 PM</b>				
Client ID:		Run ID: <b>GC6_130203A</b>		SeqNo: <b>561464</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Methyl tert-butyl ether	ND	0.010								
Benzene	ND	0.0050								
Toluene	ND	0.0050								
Ethylbenzene	ND	0.0050								
Xylenes, Total	ND	0.0050								
<i>Surr: Tetrachloroethene</i>	0.1042	0	0.1	0	104	81-118	0			

<b>LCS</b>		Sample ID: <b>LCS-R96779</b>		Units: <b>mg/Kg</b>		Analysis Date: <b>2/3/2013 01:44 PM</b>				
Client ID:		Run ID: <b>GC6_130203A</b>		SeqNo: <b>561465</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Methyl tert-butyl ether	0.2782	0.010	0.25	0	111	66-141	0			
Benzene	0.2689	0.0050	0.25	0	108	77-130	0			
Toluene	0.2688	0.0050	0.25	0	108	73-126	0			
Ethylbenzene	0.2557	0.0050	0.25	0	102	59-125	0			
Xylenes, Total	0.4983	0.0050	0.5	0	99.7	67-129	0			
<i>Surr: Tetrachloroethene</i>	0.1112	0	0.1	0	111	81-118	0			

<b>MS</b>		Sample ID: <b>1301351-03A MS</b>		Units: <b>mg/Kg</b>		Analysis Date: <b>2/3/2013 05:13 PM</b>				
Client ID:		Run ID: <b>GC6_130203A</b>		SeqNo: <b>561471</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Methyl tert-butyl ether	0.4597	0.010	0.4	0.001837	114	79-122	0			
Benzene	0.4418	0.0050	0.4	0.0004282	110	84-141	0			
Toluene	0.4254	0.0050	0.4	0.0002038	106	66-131	0			
Ethylbenzene	0.3945	0.0050	0.4	0.002584	98	43-124	0			
Xylenes, Total	0.7536	0.0050	0.8	0.003324	93.8	56-138	0			
<i>Surr: Tetrachloroethene</i>	0.1072	0	0.1	0	107	81-118	0			

<b>MSD</b>		Sample ID: <b>1301351-03A MSD</b>		Units: <b>mg/Kg</b>		Analysis Date: <b>2/3/2013 05:43 PM</b>				
Client ID:		Run ID: <b>GC6_130203A</b>		SeqNo: <b>561472</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Methyl tert-butyl ether	0.4639	0.010	0.4	0.001837	116	79-122	0.4597	0.911	20	
Benzene	0.4232	0.0050	0.4	0.0004282	106	84-141	0.4418	4.29	20	
Toluene	0.3934	0.0050	0.4	0.0002038	98.3	66-131	0.4254	7.81	20	
Ethylbenzene	0.3593	0.0050	0.4	0.002584	89.2	43-124	0.3945	9.33	20	
Xylenes, Total	0.6989	0.0050	0.8	0.003324	86.9	56-138	0.7536	7.53	20	
<i>Surr: Tetrachloroethene</i>	0.1113	0	0.1	0	111	81-118	0.1072	3.78		

The following samples were analyzed in this batch: 1301350-01A 1301350-02A

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Soil and Materials Engineers  
**Work Order:** 1301350  
**Project:** 800 Wyoming; Project No.: 063207.09

---

**QC BATCH REPORT**

---

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Soil and Materials Engineers  
**Project:** 800 Wyoming; Project No.: 063207.09  
**WorkOrder:** 1301350

## QUALIFIERS, ACRONYMS, UNITS

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
E	EPA Method
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SDL	Sample Detection Limit
SW	SW-846 Method

<u>Units Reported</u>	<u>Description</u>
% of sample	
mg/Kg-dry	

1301350


**Department  
of Commerce**

 Division of State Fire Marshal  
Bureau of Underground Storage  
Tank Regulations (BUSTR)

**LABORATORY ANALYSIS QA/QC  
SUMMARY FORM**

(To be included with each laboratory chemical analysis report)

REPORT DATE:

2/6/13

FACILITY ID#:

**SAMPLE RECEIPT**

Was the chain of custody present for all samples?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Sampler name included?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Sampler signature included?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Sample date included?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Sample time included?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
List the preservation method(s):		
List the cooler temperature upon receipt:	20 °F <input type="checkbox"/> °C <input checked="" type="checkbox"/>	
Was headspace present in any sample vials?	Yes <input type="checkbox"/>	No <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Were the soil sample containers filled?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/> NA <input type="checkbox"/>
Were sample containers tightly sealed?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Were the correct laboratory containers used?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

**SAMPLE ANALYSIS**

Were all analysis performed using SW-846 & ASTM methods?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
If not, identify the other methods used:		
Were dates of sample extraction provided?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Were the matrix spike results within the control limit range established by the USEPA?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Were surrogate recoveries within the control limit range established by the USEPA?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Were control samples used to establish appropriate control limits for precision and bias?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Were instrument blanks, calibration standards, and method blanks submitted and analyzed?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Were matrix spike samples analyzed and either matrix spike duplicates or matrix duplicate samples analyzed?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Were the following QC samples used for each analytical batch:		
Lab control samples	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Method blanks	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Matrix spikes	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Matrix spike duplicates or matrix duplicates	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Were there any problems noted with surrogate recovery, % recovery, or % RSD?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
If so, list sample IDs:		
Were there any data qualifiers noted by the lab?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
If so, list sample IDs:		

**LAB CERTIFICATION**

Is the laboratory affiliated with the sampling company?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Check lab certification that applies:	<input type="checkbox"/> Ohio EPA DDGW <input type="checkbox"/> Ohio EPA VAP <input type="checkbox"/> NELAP <input type="checkbox"/> A2LA <input type="checkbox"/> Other (list):	

**COMPLETED BY**

Print Name of Lab Representative and Title:	Signature	Date
John Ogle Director		2/6/13

Sample Receipt Checklist

Client Name: **SOIL&MATERIALS-CINCINNATI**

Date/Time Received: **23-Jan-13 08:47**

Work Order: **1301350**

Received by: **JNW**

Checklist completed by: Steve Wilcox 23-Jan-13  
eSignature Date

Reviewed by: Chris Gibson 24-Jan-13  
eSignature Date

Matrices:

Carrier name: Client

Shipping container/cooler in good condition?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temperature(s)/Thermometer(s):	<div><div>2.0</div><div></div></div>		
Cooler(s)/Kit(s):	<div></div>		
Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>
pH adjusted by:	<div>-</div>		

Login Notes:

-----

Client Contacted: Date Contacted: Person Contacted:  
Contacted By: Regarding:

Comments:

CorrectiveAction:



06-Feb-2013

Keith Egan  
Soil and Materials Engineers  
One N. Commerce Park Drive, Suite 113  
Cincinnati, OH 45215

Tel: (513) 319-8918  
Fax:

Re: 800 Wyoming; Project No.: 063207.09

Work Order: **1301351**

Dear Keith,

ALS Environmental received 4 samples on 23-Jan-2013 08:47 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 13.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Jeff Ogle

Electronically approved by: Jeff Ogle

Jeff Ogle  
Laboratory Director

ADDRESS 4388 Glendale Milford Rd Cincinnati, Ohio 45242- | PHONE (513) 733-5336 | FAX (513) 733-5347

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Environmental

[www.alsglobal.com](http://www.alsglobal.com)

RIGHT SOLUTIONS RIGHT PARTNER

**Client:** Soil and Materials Engineers  
**Project:** 800 Wyoming; Project No.: 063207.09  
**Work Order:** 1301351

## Work Order Sample Summary

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Dat</u>	<u>Date Received</u>	<u>Hold</u>
1301351-01	MW2 4-6	Soil		1/22/2013 09:45	1/23/2013 08:47	<input type="checkbox"/>
1301351-02	MW2 6-8	Soil		1/22/2013 09:50	1/23/2013 08:47	<input type="checkbox"/>
1301351-03	MW3 4-6	Soil		1/22/2013 11:30	1/23/2013 08:47	<input type="checkbox"/>
1301351-04	MW3 7-8	Soil		1/22/2013 11:35	1/23/2013 08:47	<input type="checkbox"/>

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**Client:** Soil and Materials Engineers  
**Project:** 800 Wyoming; Project No.: 063207.09  
**Work Order:** 1301351

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**Case Narrative**

The analytical data provided relates directly to the samples received by ALS Laboratory Group and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

**ALS Environmental**

Date: 06-Feb-13

**Client:** Soil and Materials Engineers  
**Project:** 800 Wyoming; Project No.: 063207.09  
**Sample ID:** MW2 4-6  
**Collection Date:** 1/22/2013 09:45 AM

**Work Order:** 1301351  
**Lab ID:** 1301351-01  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>GASOLINE RANGE ORGANICS (C6-C12)</b>			<b>SW8015A</b>			Analyst: <b>TJH</b>
TPH C6-C12	25		2.2	mg/Kg-dry	1	1/25/2013 01:11 AM
Surr: Cyclooctane	121		55-135	%REC	1	1/25/2013 01:11 AM
<b>VOLATILES BY GC-PID</b>			<b>SW8021</b>			Analyst: <b>TJH</b>
Methyl tert-butyl ether	ND		0.011	mg/Kg-dry	1	2/3/2013 03:43 PM
Benzene	ND		0.0056	mg/Kg-dry	1	2/3/2013 03:43 PM
Toluene	ND		0.0056	mg/Kg-dry	1	2/3/2013 03:43 PM
Ethylbenzene	0.039		0.0056	mg/Kg-dry	1	2/3/2013 03:43 PM
Xylenes, Total	0.029		0.0056	mg/Kg-dry	1	2/3/2013 03:43 PM
Surr: Tetrachloroethene	106		81-118	%REC	1	2/3/2013 03:43 PM
<b>MOISTURE</b>			<b>SM2540B</b>		Prep Date: <b>2/5/2013</b>	Analyst: <b>YCL</b>
Moisture	11		0.010	% of sample	1	2/5/2013

---

**Note:**

**ALS Environmental**

Date: 06-Feb-13

**Client:** Soil and Materials Engineers  
**Project:** 800 Wyoming; Project No.: 063207.09  
**Sample ID:** MW2 6-8  
**Collection Date:** 1/22/2013 09:50 AM

**Work Order:** 1301351  
**Lab ID:** 1301351-02  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>GASOLINE RANGE ORGANICS (C6-C12)</b>			<b>SW8015A</b>			Analyst: <b>TJH</b>
TPH C6-C12	3.8		2.4	mg/Kg-dry	1	1/25/2013 01:41 AM
Surr: Cyclooctane	109		55-135	%REC	1	1/25/2013 01:41 AM
<b>VOLATILES BY GC-PID</b>			<b>SW8021</b>			Analyst: <b>TJH</b>
Methyl tert-butyl ether	ND		0.012	mg/Kg-dry	1	2/3/2013 04:13 PM
Benzene	ND		0.0059	mg/Kg-dry	1	2/3/2013 04:13 PM
Toluene	ND		0.0059	mg/Kg-dry	1	2/3/2013 04:13 PM
Ethylbenzene	0.0098		0.0059	mg/Kg-dry	1	2/3/2013 04:13 PM
Xylenes, Total	0.012		0.0059	mg/Kg-dry	1	2/3/2013 04:13 PM
Surr: Tetrachloroethene	108		81-118	%REC	1	2/3/2013 04:13 PM
<b>MOISTURE</b>			<b>SM2540B</b>		Prep Date: <b>2/5/2013</b>	Analyst: <b>YCL</b>
Moisture	15		0.010	% of sample	1	2/5/2013

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**Note:**

**ALS Environmental**

Date: 06-Feb-13

Client: Soil and Materials Engineers

Project: 800 Wyoming; Project No.: 063207.09

Sample ID: MW3 4-6

Collection Date: 1/22/2013 11:30 AM

Work Order: 1301351

Lab ID: 1301351-03

Matrix: SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>GASOLINE RANGE ORGANICS (C6-C12)</b>			<b>SW8015A</b>			Analyst: <b>TJH</b>
TPH C6-C12	ND		2.3	mg/Kg-dry	1	1/25/2013 02:10 AM
Surr: Cyclooctane	105		55-135	%REC	1	1/25/2013 02:10 AM
<b>VOLATILES BY GC-PID</b>			<b>SW8021</b>			Analyst: <b>TJH</b>
Methyl tert-butyl ether	ND		0.012	mg/Kg-dry	1	2/3/2013 04:43 PM
Benzene	ND		0.0059	mg/Kg-dry	1	2/3/2013 04:43 PM
Toluene	ND		0.0059	mg/Kg-dry	1	2/3/2013 04:43 PM
Ethylbenzene	ND		0.0059	mg/Kg-dry	1	2/3/2013 04:43 PM
Xylenes, Total	ND		0.0059	mg/Kg-dry	1	2/3/2013 04:43 PM
Surr: Tetrachloroethene	106		81-118	%REC	1	2/3/2013 04:43 PM
<b>MOISTURE</b>			<b>SM2540B</b>		Prep Date: <b>2/5/2013</b>	Analyst: <b>YCL</b>
Moisture	15		0.010	% of sample	1	2/5/2013

Note:

**ALS Environmental**

Date: 06-Feb-13

**Client:** Soil and Materials Engineers  
**Project:** 800 Wyoming; Project No.: 063207.09  
**Sample ID:** MW3 7-8  
**Collection Date:** 1/22/2013 11:35 AM

**Work Order:** 1301351  
**Lab ID:** 1301351-04  
**Matrix:** SOIL

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>GASOLINE RANGE ORGANICS (C6-C12)</b>			<b>SW8015A</b>			Analyst: <b>TJH</b>
TPH C6-C12	ND		2.4	mg/Kg-dry	1	1/25/2013 03:40 AM
Surr: Cyclooctane	103		55-135	%REC	1	1/25/2013 03:40 AM
<b>VOLATILES BY GC-PID</b>			<b>SW8021</b>			Analyst: <b>TJH</b>
Methyl tert-butyl ether	ND		0.012	mg/Kg-dry	1	2/3/2013 06:13 PM
Benzene	ND		0.0061	mg/Kg-dry	1	2/3/2013 06:13 PM
Toluene	ND		0.0061	mg/Kg-dry	1	2/3/2013 06:13 PM
Ethylbenzene	ND		0.0061	mg/Kg-dry	1	2/3/2013 06:13 PM
Xylenes, Total	ND		0.0061	mg/Kg-dry	1	2/3/2013 06:13 PM
Surr: Tetrachloroethene	106		81-118	%REC	1	2/3/2013 06:13 PM
<b>MOISTURE</b>			<b>SM2540B</b>		Prep Date: <b>2/5/2013</b>	Analyst: <b>YCL</b>
Moisture	18		0.010	% of sample	1	2/5/2013

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**Note:**

Batch ID: R96701      Instrument ID GC6      Method: SW8015A

MBLK		Sample ID: BLK-R96701			Units: mg/Kg		Analysis Date: 1/24/2013 08:26 PM			
Client ID:		Run ID: GC6_130124C			SeqNo: 560537		Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH C6-C12	ND	2.0								
Surr: Cyclooctane	100.3	0	100	0	100	55-135	0			

LCS		Sample ID: LCS-R96701			Units: mg/Kg		Analysis Date: 1/24/2013 09:26 PM			
Client ID:		Run ID: GC6_130124C			SeqNo: 560538		Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH C6-C12	19.36	2.0	20	0	96.8	69.5-120	0			
Surr: Cyclooctane	118	0	100	0	118	55-135	0			

MS		Sample ID: 1301351-03A MS			Units: mg/Kg		Analysis Date: 1/25/2013 02:40 AM			
Client ID: MW3 4-6		Run ID: GC6_130124C			SeqNo: 560544		Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH C6-C12	16.35	2.0	20	1.199	75.7	28.8-111	0			
Surr: Cyclooctane	109.2	0	100	0	109	55-135	0			

MSD		Sample ID: 1301351-03A MSD			Units: mg/Kg		Analysis Date: 1/25/2013 03:10 AM			
Client ID: MW3 4-6		Run ID: GC6_130124C			SeqNo: 560545		Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
TPH C6-C12	16.65	2.0	20	1.199	77.3	22.5-117	16.35	1.87	15.7	
Surr: Cyclooctane	111.5	0	100	0	111	55-135	109.2	2.05		

The following samples were analyzed in this batch:

1301351-01A	1301351-02A	1301351-03A
1301351-04A		

**Client:** Soil and Materials Engineers  
**Work Order:** 1301351  
**Project:** 800 Wyoming; Project No.: 063207.09

## QC BATCH REPORT

Batch ID: **R96779** Instrument ID **GC6** Method: **SW8021**

<b>MBLK</b>		Sample ID: <b>BLK-R96779</b>		Units: <b>mg/Kg</b>		Analysis Date: <b>2/3/2013 12:45 PM</b>				
Client ID:		Run ID: <b>GC6_130203A</b>		SeqNo: <b>561464</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Methyl tert-butyl ether	ND	0.010								
Benzene	ND	0.0050								
Toluene	ND	0.0050								
Ethylbenzene	ND	0.0050								
Xylenes, Total	ND	0.0050								
<i>Surr: Tetrachloroethene</i>	0.1042	0	0.1	0	104	81-118	0			

<b>LCS</b>		Sample ID: <b>LCS-R96779</b>		Units: <b>mg/Kg</b>		Analysis Date: <b>2/3/2013 01:44 PM</b>				
Client ID:		Run ID: <b>GC6_130203A</b>		SeqNo: <b>561465</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Methyl tert-butyl ether	0.2782	0.010	0.25	0	111	66-141	0			
Benzene	0.2689	0.0050	0.25	0	108	77-130	0			
Toluene	0.2688	0.0050	0.25	0	108	73-126	0			
Ethylbenzene	0.2557	0.0050	0.25	0	102	59-125	0			
Xylenes, Total	0.4983	0.0050	0.5	0	99.7	67-129	0			
<i>Surr: Tetrachloroethene</i>	0.1112	0	0.1	0	111	81-118	0			

<b>MS</b>		Sample ID: <b>1301351-03A MS</b>		Units: <b>mg/Kg</b>		Analysis Date: <b>2/3/2013 05:13 PM</b>				
Client ID: <b>MW3 4-6</b>		Run ID: <b>GC6_130203A</b>		SeqNo: <b>561471</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Methyl tert-butyl ether	0.4597	0.010	0.4	0.001837	114	79-122	0			
Benzene	0.4418	0.0050	0.4	0.0004282	110	84-141	0			
Toluene	0.4254	0.0050	0.4	0.0002038	106	66-131	0			
Ethylbenzene	0.3945	0.0050	0.4	0.002584	98	43-124	0			
Xylenes, Total	0.7536	0.0050	0.8	0.003324	93.8	56-138	0			
<i>Surr: Tetrachloroethene</i>	0.1072	0	0.1	0	107	81-118	0			

<b>MSD</b>		Sample ID: <b>1301351-03A MSD</b>		Units: <b>mg/Kg</b>		Analysis Date: <b>2/3/2013 05:43 PM</b>				
Client ID: <b>MW3 4-6</b>		Run ID: <b>GC6_130203A</b>		SeqNo: <b>561472</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Methyl tert-butyl ether	0.4639	0.010	0.4	0.001837	116	79-122	0.4597	0.911	20	
Benzene	0.4232	0.0050	0.4	0.0004282	106	84-141	0.4418	4.29	20	
Toluene	0.3934	0.0050	0.4	0.0002038	98.3	66-131	0.4254	7.81	20	
Ethylbenzene	0.3593	0.0050	0.4	0.002584	89.2	43-124	0.3945	9.33	20	
Xylenes, Total	0.6989	0.0050	0.8	0.003324	86.9	56-138	0.7536	7.53	20	
<i>Surr: Tetrachloroethene</i>	0.1113	0	0.1	0	111	81-118	0.1072	3.78		

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Soil and Materials Engineers  
**Work Order:** 1301351  
**Project:** 800 Wyoming; Project No.: 063207.09

**QC BATCH REPORT**

Batch ID: **R96779**      Instrument ID **GC6**      Method: **SW8021**

The following samples were analyzed in this batch:

1301351-01A	1301351-02A	1301351-03A
1301351-04A		

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Soil and Materials Engineers  
**Project:** 800 Wyoming; Project No.: 063207.09  
**WorkOrder:** 1301351

## QUALIFIERS, ACRONYMS, UNITS

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
E	EPA Method
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SDL	Sample Detection Limit
SW	SW-846 Method

<u>Units Reported</u>	<u>Description</u>
% of sample	
mg/Kg-dry	



Department  
of Commerce

Division of State Fire Marshal  
Bureau of Underground Storage  
Tank Regulations (BUSTR)

1301351

LABORATORY ANALYSIS QA/QC  
SUMMARY FORM

(To be included with each laboratory chemical analysis report)

REPORT DATE: 2/6/13

FACILITY ID#: \_\_\_\_\_

SAMPLE RECEIPT

Was the chain of custody present for all samples?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Sampler name included?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Sampler signature included?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Sample date included?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Sample time included?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
List the preservation method(s):		
List the cooler temperature upon receipt:	2.0 °F <input type="checkbox"/> °C <input checked="" type="checkbox"/>	
Was headspace present in any sample vials?	Yes <input type="checkbox"/>	No <input type="checkbox"/> NA <input checked="" type="checkbox"/>
Were the soil sample containers filled?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/> NA <input type="checkbox"/>
Were sample containers tightly sealed?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Were the correct laboratory containers used?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

SAMPLE ANALYSIS

Were all analysis performed using SW-846 & ASTM methods?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
If not, identify the other methods used:		
Were dates of sample extraction provided?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Were the matrix spike results within the control limit range established by the USEPA?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Were surrogate recoveries within the control limit range established by the USEPA?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Were control samples used to establish appropriate control limits for precision and bias?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Were instrument blanks, calibration standards, and method blanks submitted and analyzed?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Were matrix spike samples analyzed and either matrix spike duplicates or matrix duplicate samples analyzed?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Were the following QC samples used for each analytical batch:		
Lab control samples	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Method blanks	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Matrix spikes	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Matrix spike duplicates or matrix duplicates	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
Were there any problems noted with surrogate recovery, % recovery, or % RSD?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
If so, list sample IDs:		
Were there any data qualifiers noted by the lab?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
If so, list sample IDs:		

LAB CERTIFICATION

Is the laboratory affiliated with the sampling company?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Check lab certification that applies:	<input type="checkbox"/> Ohio EPA DDGW <input type="checkbox"/> Ohio EPA VAP <input type="checkbox"/> NELAP <input type="checkbox"/> A2LA	
	<input type="checkbox"/> Other (list):	

COMPLETED BY

Print Name of Lab Representative and Title:	Signature	Date
<u>Scott Gle / Director</u>	<u>[Signature]</u>	<u>2/6/13</u>

Sample Receipt Checklist

Client Name: **SOIL&MATERIALS-CINCINNATI**

Date/Time Received: **23-Jan-13 08:47**

Work Order: **1301351**

Received by: **JNW**

Checklist completed by: Steve Wilcox 23-Jan-13  
eSignature Date

Reviewed by: Chris Gibson 24-Jan-13  
eSignature Date

Matrices:

Carrier name: Client

Shipping container/cooler in good condition?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temperature(s)/Thermometer(s):	<input type="text" value="2.0"/>		
Cooler(s)/Kit(s):	<input type="text"/>		
Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted by:	<input type="text" value="-"/>		

Login Notes:

-----

Client Contacted: Date Contacted: Person Contacted:  
Contacted By: Regarding:

Comments:

CorrectiveAction:



06-Feb-2013

Keith Egan  
Soil and Materials Engineers  
One N. Commerce Park Drive, Suite 113  
Cincinnati, OH 45215

Tel: (513) 898-9430  
Fax:

Re: 800 Wyoming; PN 06320709

Work Order: **1301433**

Dear Keith,

ALS Environmental received 5 samples on 28-Jan-2013 12:00 PM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 12.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

Chris Gibson

Electronically approved by: Chris Gibson

Chris Gibson  
Project Manager

ADDRESS 4388 Glendale Milford Rd Cincinnati, Ohio 45242- | PHONE (513) 733-5336 | FAX (513) 733-5347

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RIGHT SOLUTIONS RIGHT PARTNER

---

**Client:** Soil and Materials Engineers  
**Project:** 800 Wyoming; PN 06320709  
**Work Order:** 1301433

---

**Work Order Sample Summary**

<u>Lab Samp ID</u>	<u>Client Sample ID</u>	<u>Matrix</u>	<u>Tag Number</u>	<u>Collection Date</u>	<u>Date Received</u>	<u>Hold</u>
1301433-01	MW1-GW	Water		1/28/2013 09:25	1/28/2013 12:00	<input type="checkbox"/>
1301433-02	MW2-GW	Water		1/28/2013 10:05	1/28/2013 12:00	<input type="checkbox"/>
1301433-03	MW3-GW	Water		1/28/2013 10:45	1/28/2013 12:00	<input type="checkbox"/>
1301433-04	Dup-1 GW	Water		1/28/2013	1/28/2013 12:00	<input type="checkbox"/>
1301433-05	Trip Blank	Water		1/28/2013	1/28/2013 12:00	<input type="checkbox"/>

---

**Client:** Soil and Materials Engineers  
**Project:** 800 Wyoming, PN 06320709  
**Work Order:** 1301433

---

**Case Narrative**

The analytical data provided relates directly to the samples received by ALS Laboratory Group and for only the analyses requested.

QC sample results for this data met laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Laboratory Group. Samples will be disposed in 30 days unless storage arrangements are made.

**ALS Environmental**

Date: 06-Feb-13

**Client:** Soil and Materials Engineers  
**Project:** 800 Wyoming; PN 06320709  
**Sample ID:** MW1-GW  
**Collection Date:** 1/28/2013 09:25 AM

**Work Order:** 1301433  
**Lab ID:** 1301433-01  
**Matrix:** WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>VOLATILES BY GC-PID</b>			<b>SW8021</b>			Analyst: <b>TJH</b>
Methyl tert-butyl ether	ND		0.0020	mg/L	1	2/4/2013 09:03 PM
<b>Benzene</b>	<b>0.38</b>		<b>0.020</b>	<b>mg/L</b>	10	2/4/2013 09:32 PM
<b>Toluene</b>	<b>0.10</b>		<b>0.0050</b>	<b>mg/L</b>	1	2/4/2013 09:03 PM
<b>Ethylbenzene</b>	<b>0.15</b>		<b>0.0050</b>	<b>mg/L</b>	1	2/4/2013 09:03 PM
<b>Xylenes, Total</b>	<b>0.68</b>		<b>0.10</b>	<b>mg/L</b>	10	2/4/2013 09:32 PM
Surr: Tetrachloroethene	93.1		84-117	%REC	1	2/4/2013 09:03 PM

**Note:**

**ALS Environmental****Date:** 06-Feb-13**Client:** Soil and Materials Engineers**Project:** 800 Wyoming; PN 06320709**Sample ID:** MW2-GW**Collection Date:** 1/28/2013 10:05 AM**Work Order:** 1301433**Lab ID:** 1301433-02**Matrix:** WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>VOLATILES BY GC-PID</b>			<b>SW8021</b>			Analyst: <b>TJH</b>
Methyl tert-butyl ether	ND		0.0020	mg/L	1	2/4/2013 10:03 PM
Benzene	ND		0.0020	mg/L	1	2/4/2013 10:03 PM
Toluene	ND		0.0050	mg/L	1	2/4/2013 10:03 PM
Ethylbenzene	ND		0.0050	mg/L	1	2/4/2013 10:03 PM
Xylenes, Total	ND		0.010	mg/L	1	2/4/2013 10:03 PM
Surr: Tetrachloroethene	102		84-117	%REC	1	2/4/2013 10:03 PM

**Note:**

**ALS Environmental**

Date: 06-Feb-13

**Client:** Soil and Materials Engineers  
**Project:** 800 Wyoming; PN 06320709  
**Sample ID:** MW3-GW  
**Collection Date:** 1/28/2013 10:45 AM

**Work Order:** 1301433  
**Lab ID:** 1301433-03  
**Matrix:** WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>VOLATILES BY GC-PID</b>			<b>SW8021</b>			Analyst: <b>TJH</b>
Methyl tert-butyl ether	ND		0.0020	mg/L	1	2/4/2013 11:33 PM
<b>Benzene</b>	<b>0.25</b>		<b>0.010</b>	<b>mg/L</b>	5	2/5/2013 10:59 AM
Toluene	ND		0.0050	mg/L	1	2/4/2013 11:33 PM
Ethylbenzene	ND		0.0050	mg/L	1	2/4/2013 11:33 PM
Xylenes, Total	ND		0.010	mg/L	1	2/4/2013 11:33 PM
Surr: Tetrachloroethene	85.2		84-117	%REC	1	2/4/2013 11:33 PM

**Note:**

**ALS Environmental****Date:** 06-Feb-13

**Client:** Soil and Materials Engineers  
**Project:** 800 Wyoming; PN 06320709  
**Sample ID:** Dup-1 GW  
**Collection Date:** 1/28/2013

**Work Order:** 1301433  
**Lab ID:** 1301433-04  
**Matrix:** WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>VOLATILES BY GC-PID</b>			<b>SW8021</b>			Analyst: <b>TJH</b>
Methyl tert-butyl ether	ND		0.0020	mg/L	1	2/5/2013 12:03 AM
<b>Benzene</b>	<b>0.35</b>		<b>0.020</b>	<b>mg/L</b>	10	2/5/2013 11:29 AM
<b>Toluene</b>	<b>0.10</b>		<b>0.0050</b>	<b>mg/L</b>	1	2/5/2013 12:03 AM
<b>Ethylbenzene</b>	<b>0.15</b>		<b>0.0050</b>	<b>mg/L</b>	1	2/5/2013 12:03 AM
<b>Xylenes, Total</b>	<b>0.58</b>		<b>0.10</b>	<b>mg/L</b>	10	2/5/2013 11:29 AM
Surr: Tetrachloroethene	93.8		84-117	%REC	1	2/5/2013 12:03 AM

**Note:**

**ALS Environmental****Date:** 06-Feb-13**Client:** Soil and Materials Engineers**Project:** 800 Wyoming; PN 06320709**Sample ID:** Trip Blank**Collection Date:** 1/28/2013**Work Order:** 1301433**Lab ID:** 1301433-05**Matrix:** WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
<b>VOLATILES BY GC-PID</b>			<b>SW8021</b>			Analyst: <b>TJH</b>
Methyl tert-butyl ether	ND		0.0020	mg/L	1	2/5/2013 12:34 AM
Benzene	ND		0.0020	mg/L	1	2/5/2013 12:34 AM
Toluene	ND		0.0050	mg/L	1	2/5/2013 12:34 AM
Ethylbenzene	ND		0.0050	mg/L	1	2/5/2013 12:34 AM
Xylenes, Total	ND		0.010	mg/L	1	2/5/2013 12:34 AM
Surr: Tetrachloroethene	103		84-117	%REC	1	2/5/2013 12:34 AM

**Note:**

## ALS Environmental

Date: 06-Feb-13

**Client:** Soil and Materials Engineers  
**Work Order:** 1301433  
**Project:** 800 Wyoming; PN 06320709

## QC BATCH REPORT

Batch ID: **R96821** Instrument ID: **GC6** Method: **SW8021**

<b>MBLK</b>		Sample ID: <b>BLK-R96821</b>		Units: <b>mg/L</b>		Analysis Date: <b>2/4/2013 07:32 PM</b>				
Client ID:		Run ID: <b>GC6_130204A</b>		SeqNo: <b>562197</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Methyl tert-butyl ether	ND	0.0020								
Benzene	ND	0.0020								
Toluene	ND	0.0050								
Ethylbenzene	ND	0.0050								
Xylenes, Total	ND	0.010								
<i>Surr: Tetrachloroethene</i>	0.1034	0	0.1	0	103	84-117	0			

<b>LCS</b>		Sample ID: <b>LCS-R96821</b>		Units: <b>mg/L</b>		Analysis Date: <b>2/4/2013 08:33 PM</b>				
Client ID:		Run ID: <b>GC6_130204A</b>		SeqNo: <b>562198</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Methyl tert-butyl ether	0.08582	0.0020	0.08	0	107	82-121	0			
Benzene	0.08329	0.0020	0.08	0	104	85-130	0			
Toluene	0.08939	0.0050	0.08	0	112	83-124	0			
Ethylbenzene	0.0812	0.0050	0.08	0	102	66-114	0			
Xylenes, Total	0.1676	0.010	0.16	0	105	74-127	0			
<i>Surr: Tetrachloroethene</i>	0.09999	0	0.1	0	100	84-117	0			

<b>MS</b>		Sample ID: <b>1301433-02A MS</b>		Units: <b>mg/L</b>		Analysis Date: <b>2/4/2013 10:33 PM</b>				
Client ID: <b>MW2-GW</b>		Run ID: <b>GC6_130204A</b>		SeqNo: <b>562202</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Methyl tert-butyl ether	0.07435	0.0020	0.08	0.0001139	92.8	60-129	0			
Benzene	0.07924	0.0020	0.08	0.0004366	98.5	70-120	0			
Toluene	0.0764	0.0050	0.08	0	95.5	68-125	0			
Ethylbenzene	0.07762	0.0050	0.08	0.0004058	96.5	62-121	0			
Xylenes, Total	0.161	0.010	0.16	0.000088	101	71-132	0			
<i>Surr: Tetrachloroethene</i>	0.09033	0	0.1	0	90.3	84-117	0			

<b>MSD</b>		Sample ID: <b>1301433-02A MSD</b>		Units: <b>mg/L</b>		Analysis Date: <b>2/4/2013 11:03 PM</b>				
Client ID: <b>MW2-GW</b>		Run ID: <b>GC6_130204A</b>		SeqNo: <b>562203</b>		Prep Date:		DF: <b>1</b>		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Methyl tert-butyl ether	0.08048	0.0020	0.08	0.0001139	100	60-129	0.07435	7.92	16	
Benzene	0.08027	0.0020	0.08	0.0004366	99.8	70-120	0.07924	1.29	12	
Toluene	0.07806	0.0050	0.08	0	97.6	68-125	0.0764	2.15	13	
Ethylbenzene	0.07981	0.0050	0.08	0.0004058	99.3	62-121	0.07762	2.78	12	
Xylenes, Total	0.164	0.010	0.16	0.000088	102	71-132	0.161	1.82	12	
<i>Surr: Tetrachloroethene</i>	0.09462	0	0.1	0	94.6	84-117	0.09033	4.64		

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

**Client:** Soil and Materials Engineers  
**Work Order:** 1301433  
**Project:** 800 Wyoming; PN 06320709

**QC BATCH REPORT**

Batch ID: **R96821**      Instrument ID: **GC6**      Method: **SW8021**

The following samples were analyzed in this batch:

1301433-01A	1301433-02A	1301433-03A
1301433-04A	1301433-05A	

**Note:** See Qualifiers Page for a list of Qualifiers and their explanation.

## ALS Environmental

Date: 06-Feb-13

**Client:** Soil and Materials Engineers  
**Project:** 800 Wyoming; PN 06320709  
**WorkOrder:** 1301433

## QUALIFIERS, ACRONYMS, UNITS

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
E	EPA Method
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitation Limit
SDL	Sample Detection Limit
SW	SW-846 Method

<u>Units Reported</u>	<u>Description</u>
mg/L	

## Sample Receipt Checklist

Client Name: **SOIL&MATERIALS-CINCINNATI**

Date/Time Received: **28-Jan-13 12:00**

Work Order: **1301433**

Received by: **SJW**

Checklist completed by: **Steve Wilcox**

28-Jan-13

Reviewed by: **Chris Gibson**

31-Jan-13

eSignature

Date

eSignature

Date

Matrices:

Carrier name: Client

Shipping container/cooler in good condition? Yes ☒ No ☐ Not Present ☐

Custody seals intact on shipping container/cooler? Yes ☐ No ☐ Not Present ☒

Custody seals intact on sample bottles? Yes ☐ No ☐ Not Present ☒

Chain of custody present? Yes ☒ No ☐

Chain of custody signed when relinquished and received? Yes ☒ No ☐

Chain of custody agrees with sample labels? Yes ☒ No ☐

Samples in proper container/bottle? Yes ☒ No ☐

Sample containers intact? Yes ☒ No ☐

Sufficient sample volume for indicated test? Yes ☒ No ☐

All samples received within holding time? Yes ☒ No ☐

Container/Temp Blank temperature in compliance? Yes ☒ No ☐

Temperature(s)/Thermometer(s): 4.6

Cooler(s)/Kit(s):

Water - VOA vials have zero headspace? Yes ☒ No ☐ No VOA vials submitted ☐

Water - pH acceptable upon receipt? Yes ☐ No ☐ N/A ☒

pH adjusted? Yes ☐ No ☐ N/A ☒

pH adjusted by: -

Login Notes:

-----

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

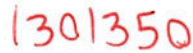
Regarding:

Comments:

CorrectiveAction:

## **APPENDIX F**

### ***Chains of Custody***



☒ **REGULAR** Status      ☐ **RUSH** Status

11332

Failure to complete all portions of this form may delay analysis. Please fill in this form *LEGIBLY*.

Relinquished by: (Signature) <i>Sten Reed</i>	Time / Date 1/23/13 0847	Received by: (Signature) <i>[Signature]</i>	Time / Date 1/23/13 0847	Ship to: <b>ALS Environmental</b> 4388 Glendale - Milford Road Cincinnati, Ohio 45242 Phone: 513.733.5336 Fax: 513.733.5347
Relinquished by: (Signature)	Time / Date	Received by: (Signature)	Time / Date	
Relinquished by: (Signature)	Time / Date	Received by: (Signature)	Time / Date	
				Carrier / Airbill #
				Date / Time:

☒☐

Page 1 of 1  
Cooler Temp: 2.0  
(Lab only)

11331

Failure to complete all portions of this form may delay analysis. Please fill in this form *LEGIBLY*.

Relinquished by: (Signature) 	Time / Date 1/23/13 0847	Received by: (Signature) 	Time / Date 1/23/13 0847
Relinquished by: (Signature)	Time / Date	Received by: (Signature)	Time / Date
Relinquished by: (Signature)	Time / Date	Received by: (Signature)	Time / Date

Ship to:	<b>ALS   Environmental</b> 4388 Glendale - Milford Road Cincinnati, Ohio 45242
Phone:	513.733.5336
Fax:	513.733.5347
Carrier / Airbill #	
Date / Time:	

1301433

☒ **REGULAR** Status

☐ RUSH Status

[illegible]

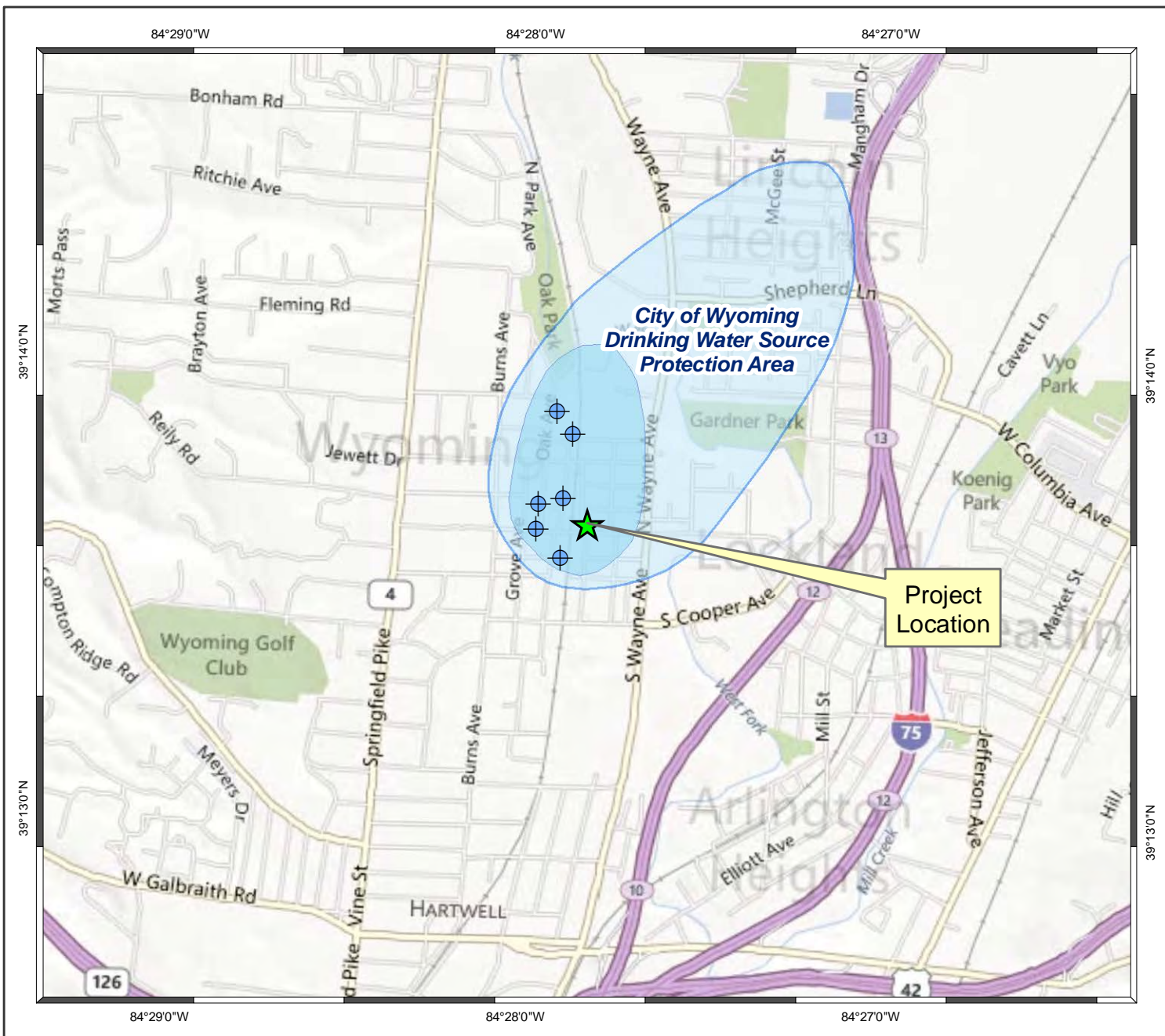
Failure to complete all portions of this form may delay analysis. Please fill in this form *LEGIBLY*.

Relinquished by: (Signature) 	Time / Date 1200 1-28-13	Received by: (Signature) 	Time / Date 1/28/13 12:00
Relinquished by: (Signature)	Time / Date	Received by: (Signature)	Time / Date
Relinquished by: (Signature)	Time / Date	Received by: (Signature)	Time / Date

Ship to:	<b>ALS Environmental</b> 4388 Glendale - Milford Road Cincinnati, Ohio 45242
Phone:	513.733.5336
Fax:	513.733.5347
Carrier / Airbill #	
Date / Time:	

## **APPENDIX G**

### ***Drinking Water Evaluation Support Documents***



## Legend

- Public Water System Wells
- Public Water System Intakes
- Ohio Sole Source Aquifers

### Source Water Protection Areas (ground water)

- Inner Management Zone (1-year time of travel)
- Drinking Water Source Protection Area (5-year time of travel)

### Source Water Protection Areas (surface water)

- |                                       |                                      |
|---------------------------------------|--------------------------------------|
| Emergency Management Zone             | Zone of High Concern - Ohio River    |
| Corridor Management Zone              | Source Water Area - Ohio River       |
| Source Water Area                     | Critical Area Zone - Lake Erie       |
| Zone of Critical Concern - Ohio River | Potential Influence Zone - Lake Erie |

## Project Request

Drinking Water Source Protection Areas, Public Water System wells and intakes, and Sole Source Aquifers near 800 West Wyoming Avenue, Lockland, Hamilton County, Ohio.

Requested by: Steve Reutter, SME Consultants

Map completed by: Linda Slattery, DDAGW

Date: February 5, 2013

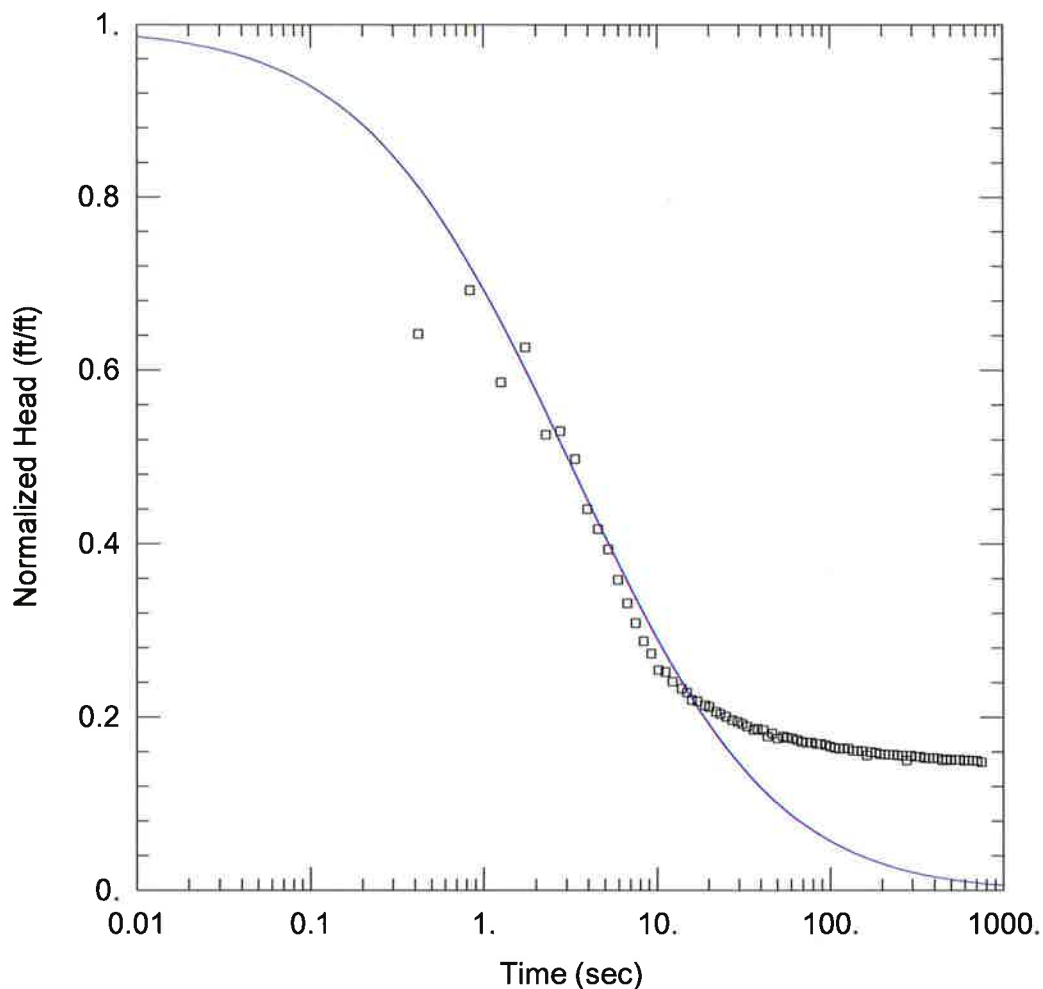
Disclaimer: Delineation of source water protection areas are ongoing. As a result, this map may not include all source water protection areas for public water systems in the area depicted.

0 0.25 0.5 1 Miles

## Drinking Water Source Protection Areas

<http://epa.ohio.gov/ddagw/swap.aspx>





### WELL TEST ANALYSIS

Data Set: \\Smefile\work in progress\063207.09\Slug Tests\MW1R1.aqt  
 Date: 02/15/13 Time: 16:19:29

### PROJECT INFORMATION

Company: SME  
 Project: 063207.09  
 Location: Cincinnati  
 Test Well: MW1  
 Test Date: 2/13/2013

### AQUIFER DATA

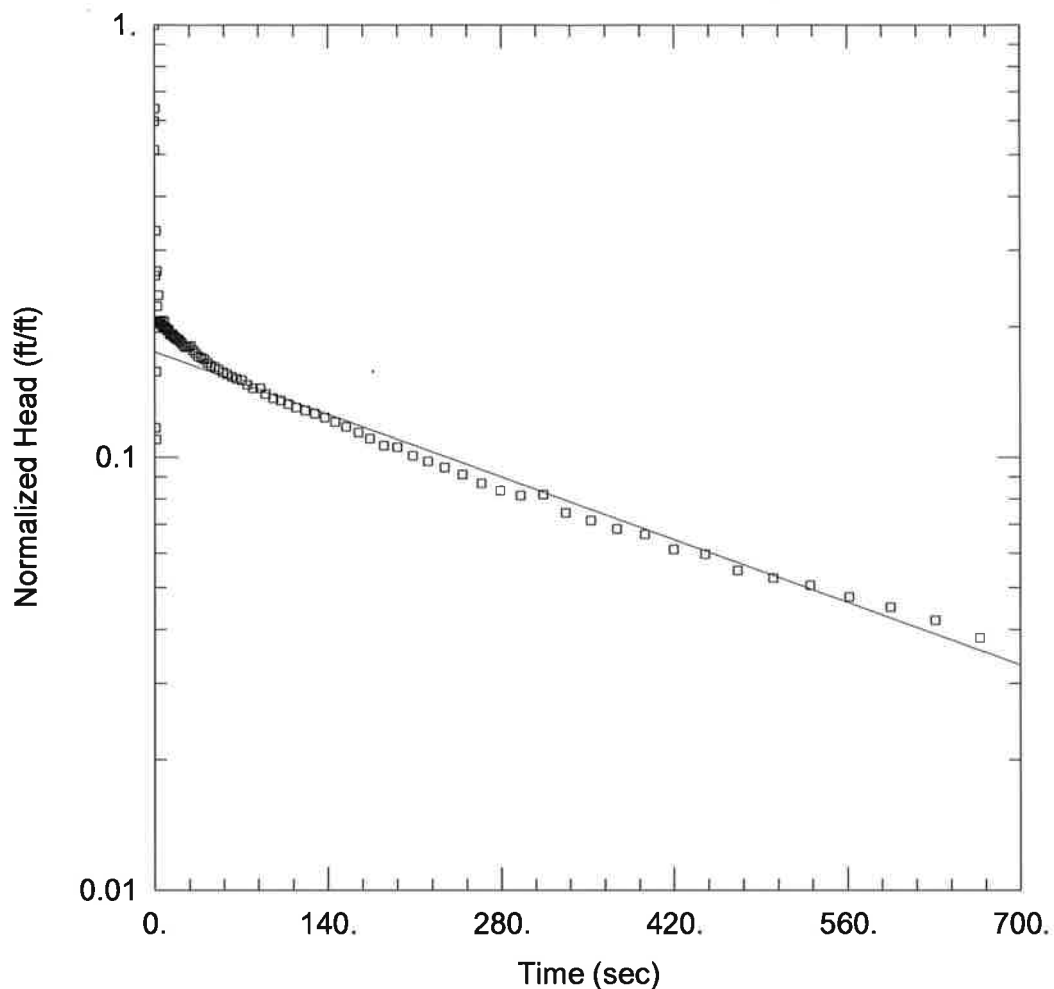
Saturated Thickness: 6.38 ft

### WELL DATA (MW1)

Initial Displacement: <u>1.02 ft</u>	Static Water Column Height: <u>10.33 ft</u>
Total Well Penetration Depth: <u>10.38 ft</u>	Screen Length: <u>10. ft</u>
Casing Radius: <u>0.083 ft</u>	Well Radius: <u>0.33 ft</u>
Well Skin Radius: <u>0.35 ft</u>	Gravel Pack Porosity: <u>0.</u>

### SOLUTION

Aquifer Model: <u>Unconfined</u>	Solution Method: <u>KGS Model w/skin</u>
Kr = <u>0.0009609 cm/sec</u>	Ss = <u>0.01567 ft<sup>-1</sup></u>
Kz/Kr = <u>1.</u>	Kr' = <u>0.0009609 cm/sec</u>
Ss' = <u>0.001 ft<sup>-1</sup></u>	Kz/Kr' = <u>1.</u>



### WELL TEST ANALYSIS

Data Set: \\Smefile\work in progress\063207.09\Slug Tests\MW3F3-H.aqt  
 Date: 02/18/13 Time: 10:31:13

### PROJECT INFORMATION

Company: SME  
 Project: 063207.09  
 Location: Cincinnati  
 Test Well: MW3  
 Test Date: 2/13/2013

### AQUIFER DATA

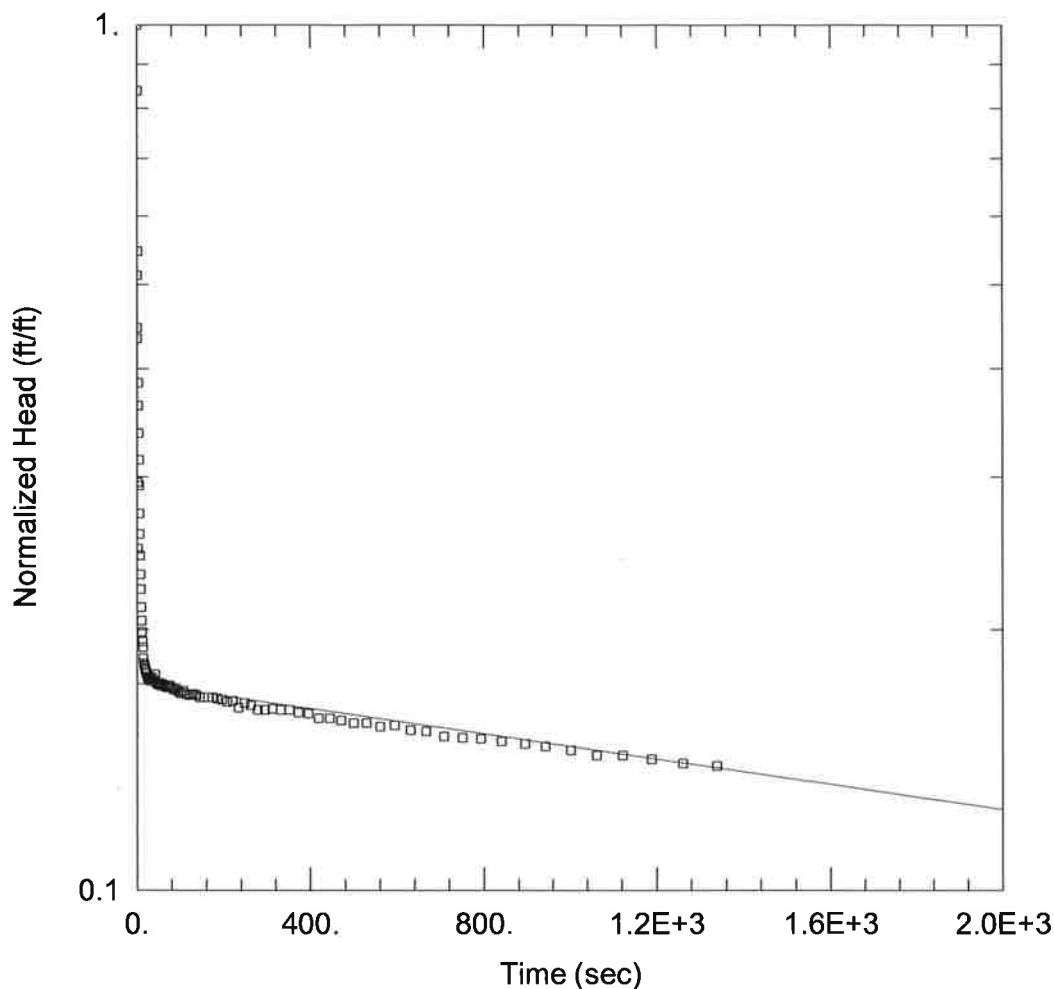
Saturated Thickness: 7.15 ft Anisotropy Ratio ( $K_z/K_r$ ): 1.

### WELL DATA (MW3)

Initial Displacement: 1.013 ft Static Water Column Height: 8.15 ft  
 Total Well Penetration Depth: 7.15 ft Screen Length: 7.15 ft  
 Casing Radius: 0.083 ft Well Radius: 0.33 ft  
 Gravel Pack Porosity: 0.

### SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev  
 $K = 0.0001591$  cm/sec  $y_0 = 0.1775$  ft



### WELL TEST ANALYSIS

Data Set: \\Smefile\work in progress\063207.09\Slug Tests\MW1F2-H.aqt  
 Date: 02/18/13 Time: 10:59:10

### PROJECT INFORMATION

Company: SME  
 Project: 063207.09  
 Location: Cincinnati  
 Test Well: MW1  
 Test Date: 2/13/2013

### AQUIFER DATA

Saturated Thickness: 6.38 ft Anisotropy Ratio ( $K_z/K_r$ ): 1.

### WELL DATA (MW1)

Initial Displacement: 1.032 ft Static Water Column Height: 10.33 ft  
 Total Well Penetration Depth: 10.38 ft Screen Length: 10. ft  
 Casing Radius: 0.083 ft Well Radius: 0.33 ft  
 Gravel Pack Porosity: 0.

### SOLUTION

Aquifer Model: Unconfined Solution Method: Hvorslev  
 $K = 1.258E-5$  cm/sec  $y_0 = 0.179$  ft